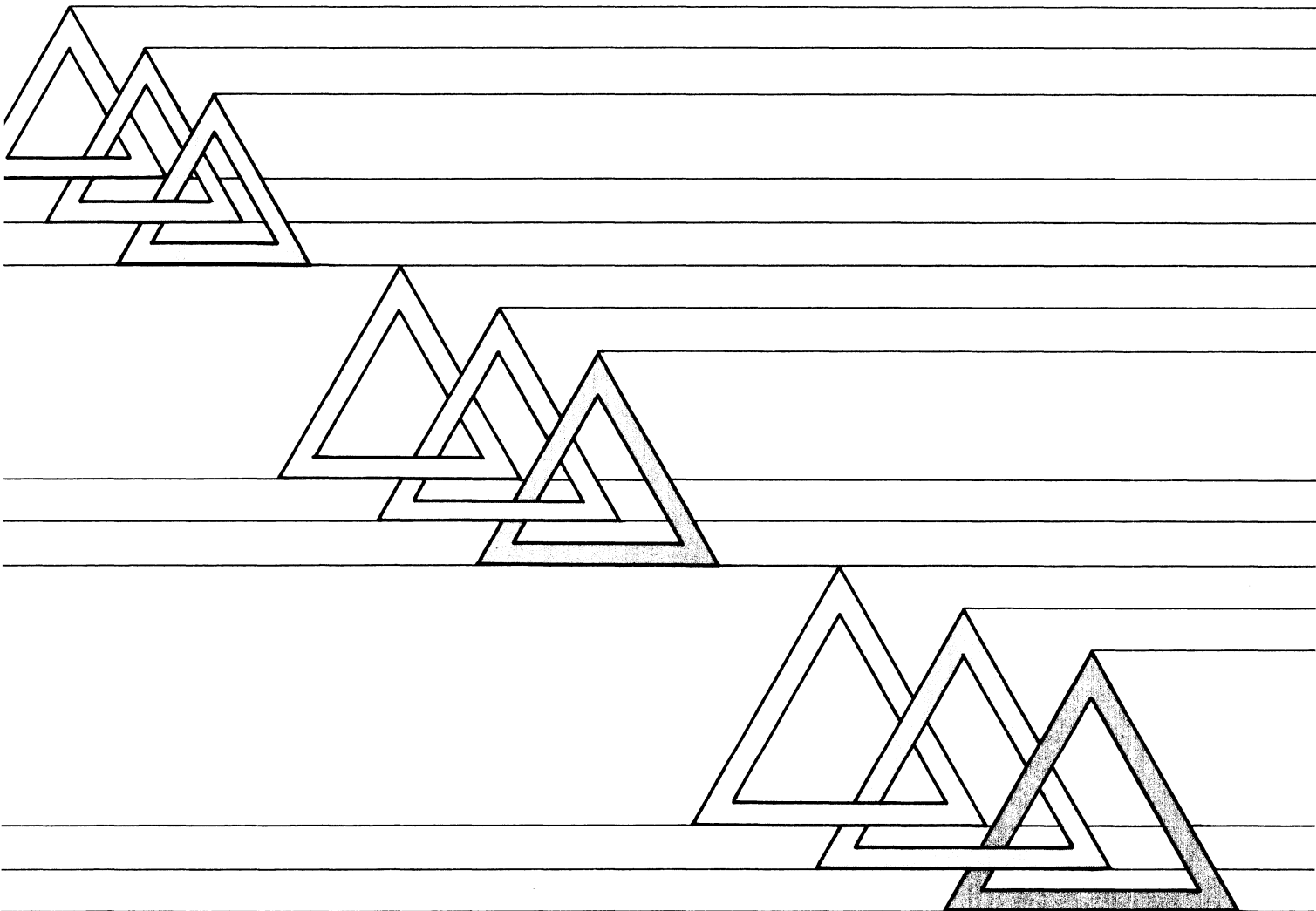


S219/VS
AOS/VS System Manager

Course Materials



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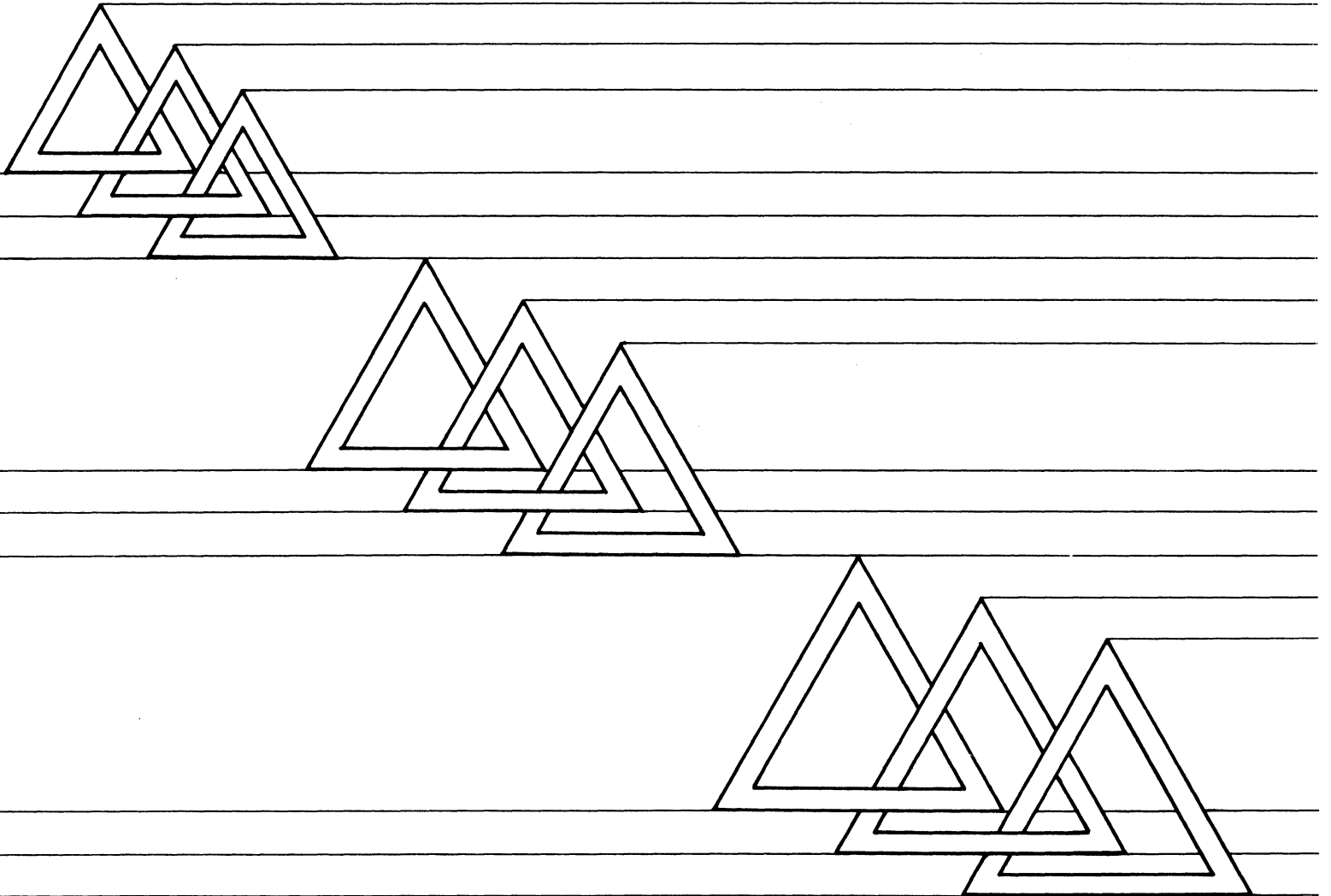
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S219/VS
AOS/VS System Manager

Course Materials



S219/VS

AOS/VS System Manager

Summary

S219/VS teaches the student how to install, generate, maintain, and run AOS/VS on an ECLIPSE® MV/Family computer.

Prerequisites

S209 (AOS/VS User), AOS/VS Self-Study, or equivalent experience.

Objectives

Provided the prerequisites are met, upon successful completion of the course, the student should be able to:

1. List typical system manager responsibilities.
2. Utilize common features of the SCP.
3. Install and generate a tailored version of AOS/VS.
4. Use and control the EXEC functions.
5. Customize system macros like UP.CLI.
6. Determine the best method for regular file backups.
7. Manage and control AOS/VS processes.
8. Manipulate process priorities and CPU scheduling.
9. Use the system management utilities like PED and DISCO.
10. Identify and respond to common system problems.
11. Recognize the need for system documentation.

Typesetting Conventions

The following typesetting conventions are used in this course to distinguish various activity:

THIS TYPEFACE IS USED TO INDICATE COMMAND OR KEY NAMES

THIS TYPEFACE IS USED TO INDICATE SYSTEM PROMPTS OR RESPONSES

THIS TYPEFACE IS USED TO INDICATE USER ENTRY

EXAMPLE

```
SCP_CLI> RESET  NL
SCP_CLI> BOOT 22  NL
TAPE FILE NUMBER? 2  NL
```

S219/VS

AOS/VS System Manager

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MODULE 1

Responsibilities of a System Manager

Objectives

Upon completion of this module, the student should be able to:

1. List possible roles a system manager can play.
2. Identify many of the professional data processing organizations.
3. Create an organizational chart for their installation.
4. Describe the components of an MIS budget.

Data Processing A Company Within a Company

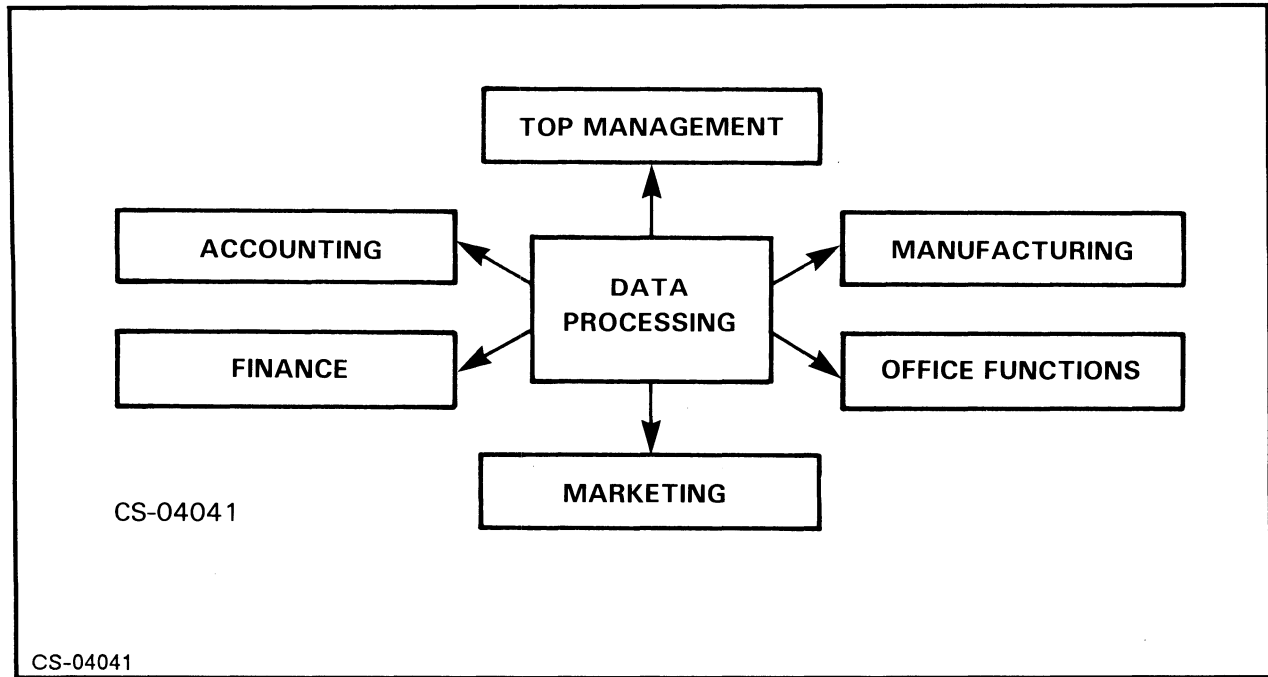
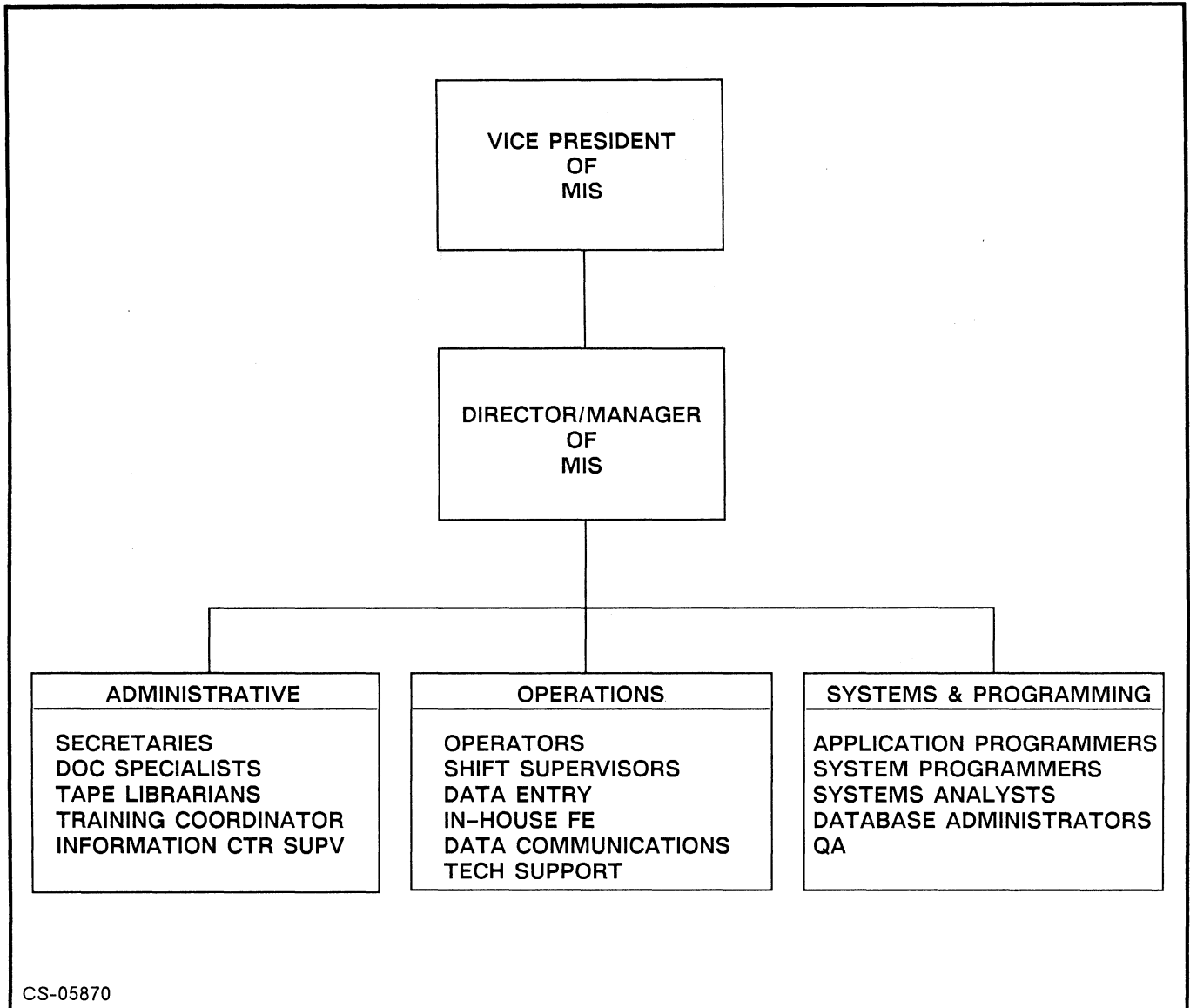


Figure 1.1

A data processing organization is a mini manufacturing company. The product produced, INFORMATION, is both timely and accurate.

Textbook MIS Organizational Chart Where the System Manager Fits



CS-05870

Figure 1.2

This chart will vary depending upon the organizational size.

Possible Roles of System Manager

Management Interface

- Growth Planning
- Budgeting
- Steering Committees
- Training of Managers and Users

Programming Manager

- Set Standards
- Interface with Users
- Prioritize User Requests

Operations Manager

- Backups
- Security
- Documentation
- Performance Monitoring and Machine Loading

Components of a Typical MIS Budget

G & A (General and Administrative)

- Salaries
- Benefits
- Recruiting Costs

Hardware

- Equipment Purchases
- Equipment Leases
- Maintenance

Software

- DG System Software/Products
- Special Software/3rd Party
- "Off the Shelf" Application Packages

Communications

- Line Access Charges
- Public Carrier Charges
- Data Communication Hardware

Supplies

- Magnetic Media
- Special Forms
- Ribbons/Office Supplies/Furniture

Education

- Data General Classes
- CBT's
- Books/Trade Journals
- Professional Society Memberships
- User's Group Conferences

Professional Societies, Trade Journals, Bulletin Boards

Professional Societies

Data Processing Management Association (DPMA)
International Headquarters
505 Busse Highway
Park Ridge, IL 60068
(312) 825-8124

American Management Association (AMA)
135 West 50th Street
New York, NY 10020
(212) 903-8255

Association For Systems Management (ASM)
ASM International Headquarters
24587 Bagley Road
Cleveland, OH 44138
(216) 243-6900

North American Data General Users Group (NADGUG)
(800) 825-4442

Trade Journals

Datamation	Computerworld
MIS Week	INFO Week
Information Systems News	Computer Decisions
Computing Canada	Mini/Micro Systems
Information Center	PC World
✧ FOCUS	✧ DG Review

Bulletin Boards for Data General Users

◊ NADGUG Bulletin Board
Rational Data Systems 300/1200/2400/9600 Baud
(415) 924-3652

On-Line Information Service (OIS)
Data General Bulletin Board for OIS Customers
DG Field Engineering (800) 325-3065 in MA (800) 952-4300

:SYSMGR BBS
:SYSMGR, A Division of B.J. Inc. X, YMODEM KERMIT 1200 Baud
(415) 391-6531

User's Groups

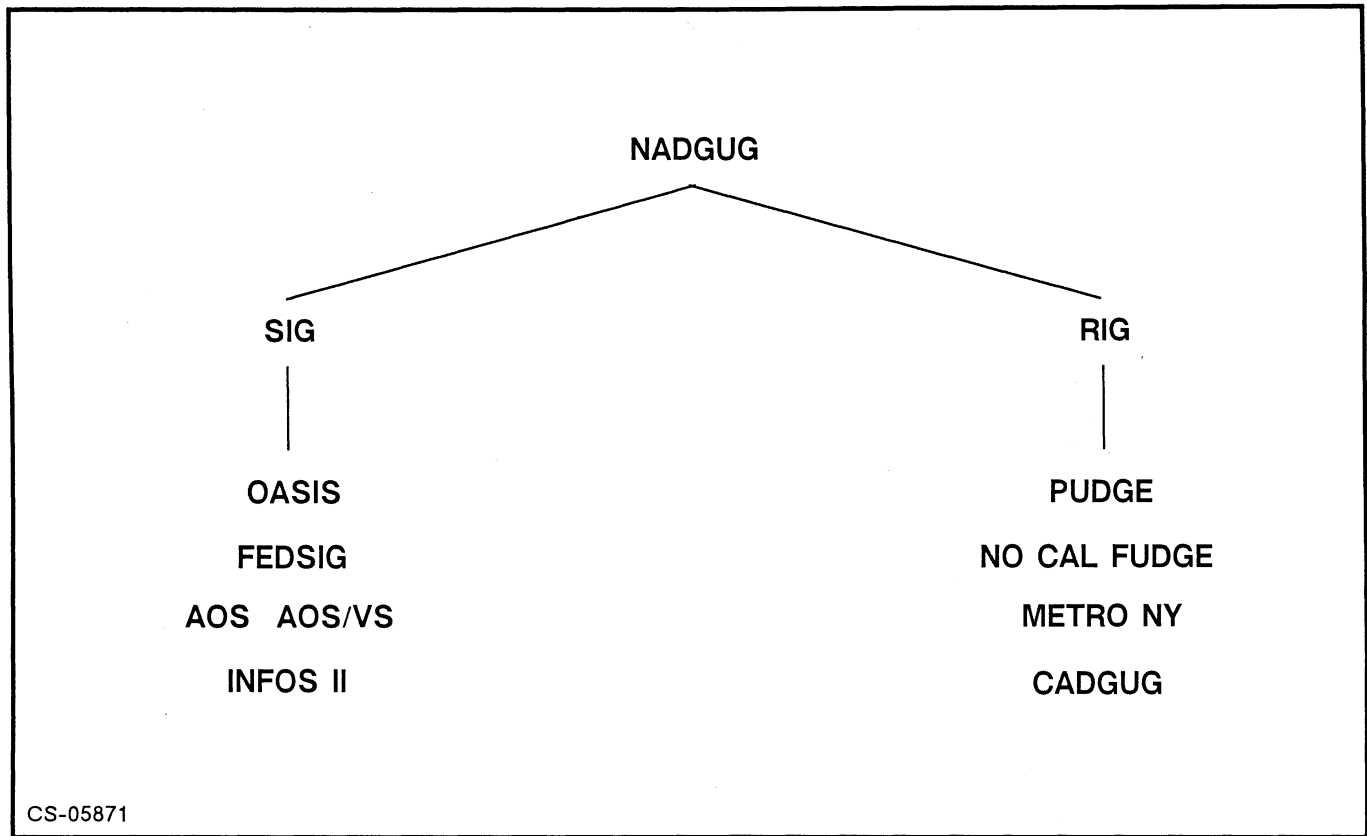


Figure 1.3

Why join a user's group? What are the benefits?

- Free subscription to FOCUS magazine
- Access to free NADGUG software library
- Networking with other Data General users
- Electronic bulletin boards
- Member directory
- Open communication channel to Data General
- Sharing of ideas for problem resolutions
- Staying current with industry changes
- Greater personal growth
- Annual conferences
- Access to RIG/SIG organizations and software, publications

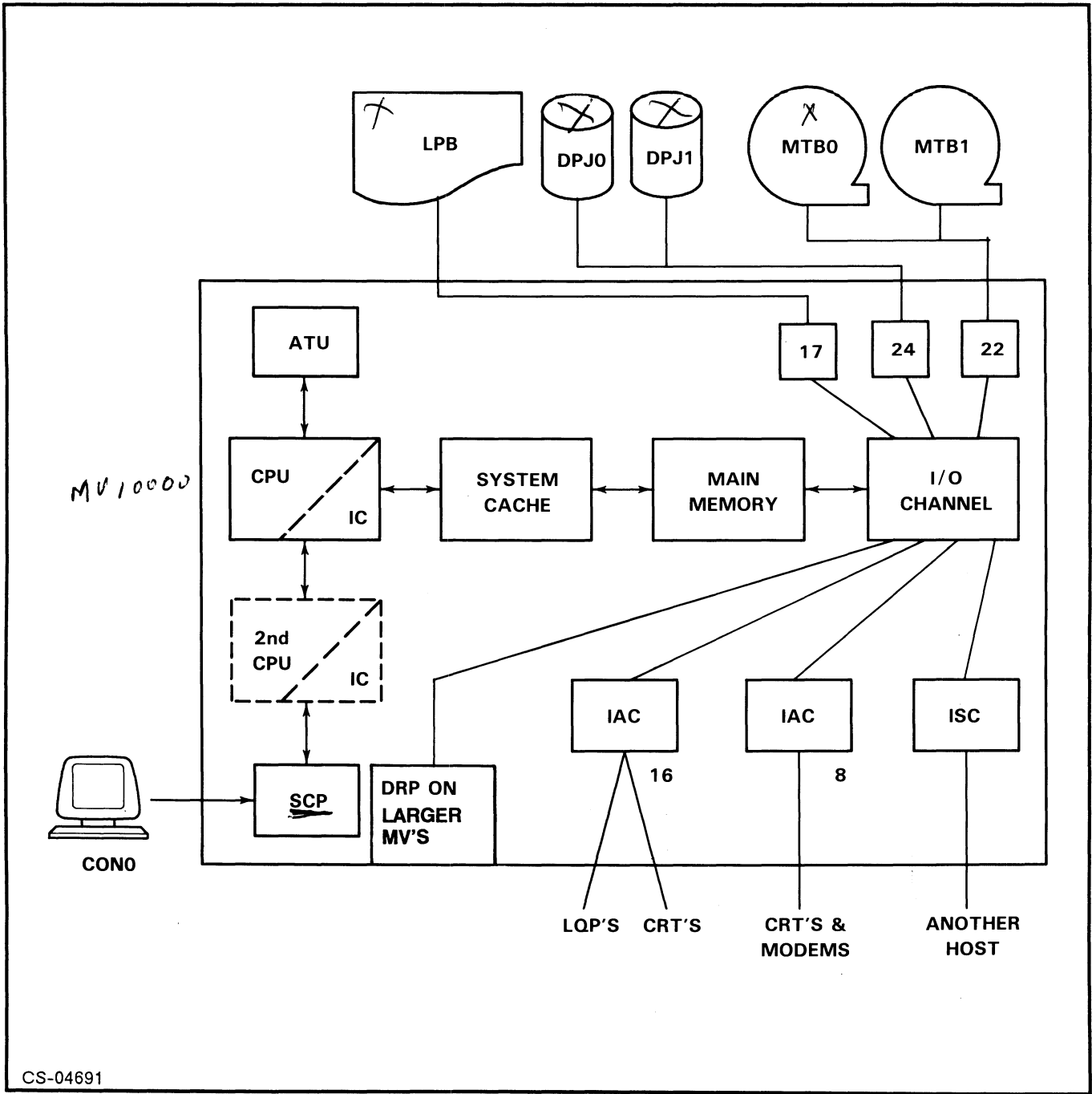
MODULE 2

ECLIPSE MV/Family Hardware/Software Overview

Objectives

Upon completion of this module, the student should be able to:

1. Recognize the main MV/Family hardware components.
2. Describe the use of the System Control Processor.
3. Issue SCP commands.
4. Run the ERRLOG utility.



CS-04691

Figure 2.1 ECLIPSE MV/Family Basic Architecture

ECLIPSE MV/Family Main Hardware Components

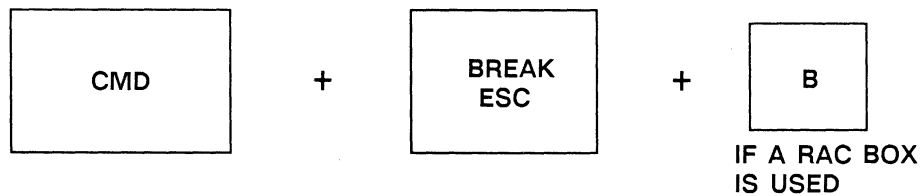
Component	Description
MAIN MEMORY	The physical memory of the machine
SYSTEM CACHE	Used to store frequently used file system information
ADDRESS TRANSLATION UNIT <i>HARDWARE</i>	Make pages of a process appear as if they are one stack, instead of scattered. Translate logical addresses a program uses and converts them into physical memory locations
CPU	The central processing unit
INPUT/OUTPUT CHANNEL	The channel for communication between memory and controllers, and the CPU
SYSTEM CONTROL PROCESSOR	Interface between the OP console and the CPU
DIAGNOSTIC REMOTE PROCESSOR	Diagnoses problems and notifies RAC center. Supports powerup and system clock
DEVICE CONTROLLERS	Intelligent boards managing peripheral devices like tape, disk, printers, CRTs, and networking to other MV's
OPERATOR'S CONSOLE	Terminal wired directly to the SCP, used to boot and control AOS/VS

System Control Processor Features

The SCP runs either concurrently or in lieu of AOS/VS, depending upon the machine. Any system larger than an MV/7800 will have SCP in a separate processor running SCP-OS. The SCP changes the main processor state, so changes should be done when AOS/VS is shut down.

Getting to the SCP

Pressing this sequence of keys at the OP Console CRT puts you in the SCP:



Most Used SCP Commands

Once in the SCP, the prompt will become: SCP-CLI>

SCP-CLI> HELP

CONSOLE OPERATING SYSTEM

B(OOT) 24	LOAD FROM AN I/O DEVICE
CO(NTINUE)	CONTINUE CPU EXECUTION
FL(AGS)	SET/CLEAR SYSTEM PARAMETER FLAGS
HA(LT)	HALT THE CPU
HE(LP)	PRINT HELP MESSAGES
L(OCK)	LOCK THE SYSTEM
R(ESET)	RESET THE CPU
ST(ART) 50	START CPU PROGRAM EXECUTION
TI(ME)	DISPLAY DATE AND TIME
TT(Y)	ENTER TTY MODE <i>CONTINUES PROCESS</i>
XE(Q)	EXECUTE A SCP UTILITY
.	TYPE CPU STATUS

SCP ERRLOG Utility

- ERRLOG is an SCP-OS utility program that records and displays CPU events such as hard and soft errors.
- The ERRLOG utility is available on machines larger than an MV/7800.
- To set up the recording of events by ERRLOG:

```
SCP-CLI> FLAGS ELOG Y NL
```

```
SCP-CLI> X ERRLOG
```

```
SCP-ERR> LIST
```

```
INPUT TYPE(S)
```

```
TYPE:
```

```
INPUT DATE (MM DD YY)
```

```
FIRST DATE:
```

```
LAST DATE:
```

```
INPUT TIME (HH MM)
```

```
FIRST TIME:
```

```
LAST TIME:
```

```
03/12/87  19:11    2      SYSTEM RESET
03/12/87  19:12    1      BC SOFT INTERRUPTS DISABLED
03/12/87  19:12    1      OPERATOR SYSTEM HALT
03/12/87  19:13    2      SYSTEM RESET
03/12/87  19:13    1      BC SOFT INTERRUPTS DISABLED
03/12/87  19:20    2      SYSTEM RESET
03/12/87  19:20    1      MICROSEQUENCER PARITY ERROR
PC = 00000000032 RA(HEX) = 000
03/12/87  19:20    1      BANK CTRLR PARITY ERROR
DETECTED ON BYTES: 0. 1. 2. 3
03/12/87  19:20    1      TAG STORE READ PARITY ERROR
03/12/87  19:21    1      MICROSEQUENCER PARITY ERROR
PC = 00000000040 RA(HEX) = 000
03/12/87  19:22    2      SYSTEM RESET
03/12/87  19:22    1      MICROSEQUENCER PARITY ERROR
PC = 00000000040 RA(HEX) = 000
03/12/87  19:22    1      TAG STORE READ PARITY ERROR
03/12/87  19:34    2      MV8000 LOADED
SW0 = 100024
03/12/87  19:40    0      MV8000 HALT DETECTED
AC0 = 00000000000
AC1 = 00000712030
AC2 = 00000712000
AC3 = 00000700036
PC  = 00000125576
CRY = 0
MAP = PHYS
03/12/87  19:41    2      MV8000 LOADED
SW0 = 100024
03/19/87  20:00    0      TAG STORE READ PARITY ERROR
03/19/87  21:21    2      MV8000 LOADED
SW0 = 100024
```

Virtual SCP

On machines without a physical SCP, the VIRTUAL CONSOLE functions as the SCP.

MV/Family Console

The MV/Family virtual console is a microcoded program that allows a user to interact with the MV/Family computer system, taking the place of front panel switches.

KERNEL CONSOLE

- Resides in the kernel control store ROM
- Is available whenever power is applied to the MV/4000
- Prompt is @
- Entered upon power up, if front panel is UNLOCKED
- Command: @nL (Boot a program from device code n)
TAPE @22L DISC @24L

FULL VIRTUAL CONSOLE

- Is part of system microcode, and is available only after the system microcode has been loaded into its control store RAM
- Entered by using BREAK sequence, RESET switch, and when the CPU HALTS
- Prompt is SCP-CLI>
- Accepts most SCP commands

MV/Family Software

- Two operating systems
- They run concurrently or exclusively, depending upon the MV

SCP-OS "BOOTABLE" PROGRAM EXAMPLES *STAND ALONE*

AOS/VS	DTOS
DFMTR	FIXUP
INSTL	PCOPY
ADEX	MSCOPY

AOS/VS "EXECUTABLE" PROGRAM EXAMPLES *STAND AMONG*

CLI.PR	PREDITOR.PR
LOCK_CLI.PR	DUMP_II_PR
SED.PR	LOAD_II.PR
FED.PR	MASM.PR
PED.PR	DISCO.PR
REPORT.PR	DISPLAY.PR
BRAN.PR	HISTO.PR

Interfacing with SCP-OS “Bootable” Programs

- SCP EXECUTE command

```
SCP-CLI> X ERRLOG
SCP-ERR>
```

- SCP BOOT & RESET commands

```
SCP-CLI> RESET
SCP-CLI> BOOT 24
```

- SCP Technical Maintenance Menu

6. Run the specified program

Interfacing with AOS/VS “Executable” Programs

- Interactive

```
)X
)PROC/switches } Program
)CHAIN
```

- Switch Driven

```
)X
)PROC/switches } Program
)CHAIN
```

- Command File Input

```
)PROC/IN=COMMANDFILE/SWITCH... PROGRAM
```

- Interprocess Communication

```
)CONTROL @EXEC command
FED.PR      MASM.PR
PED.PR      DISCO.PR
REPORT.PR   DISPLAY.PR
BRAN.PR     HISTO.PR
```


MODULE 3

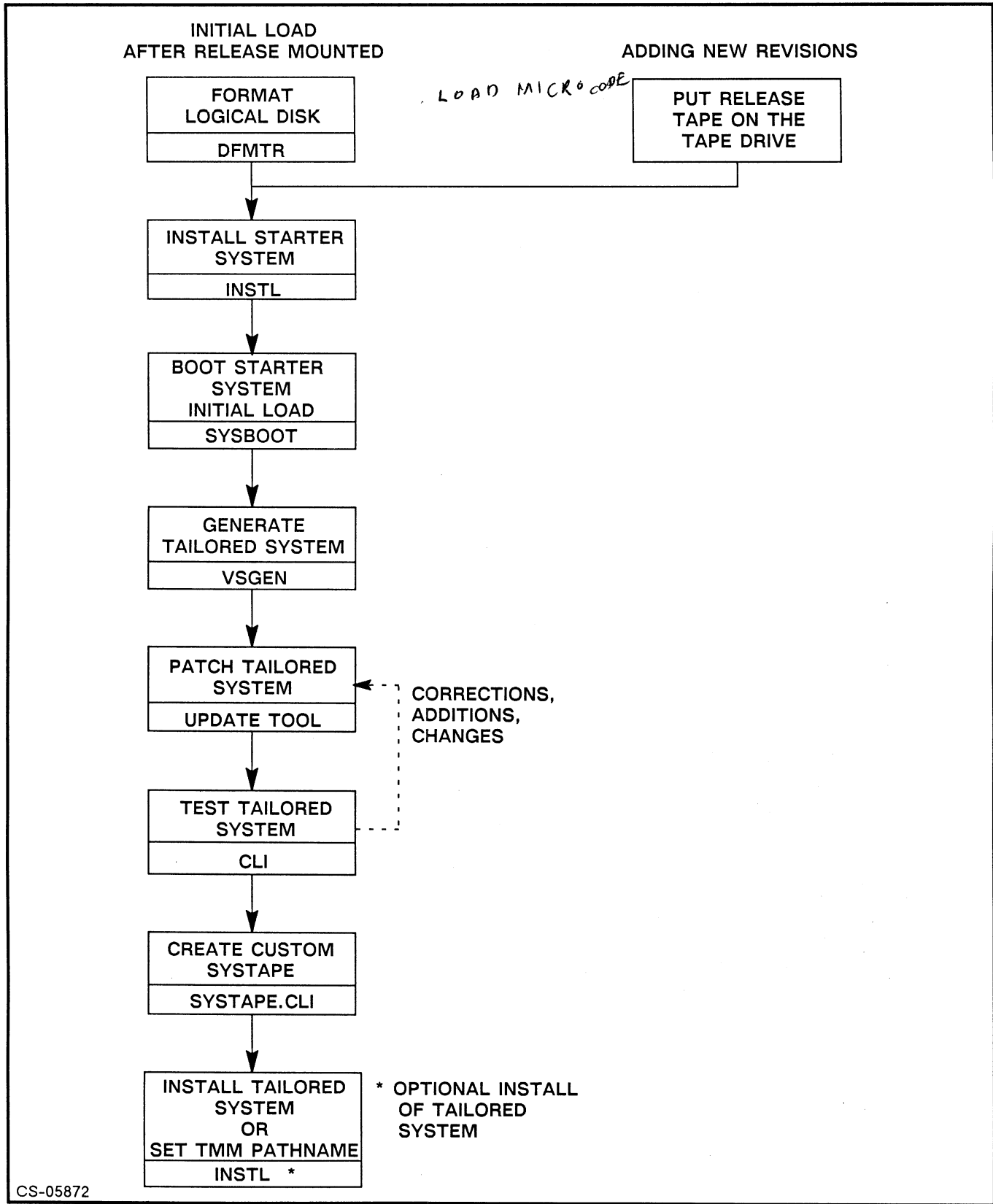
System Installation

Objectives

Upon completion of this module, the student should be able to:

1. Define logical disk.
2. Describe grafting a separate logical disk into the existing file structure of a running system.
3. State the advantages and disadvantages of using multiple physical disks in a logical disk.
4. Perform a startup from a blank disk.
5. Use the disk formatter (DFMTR) to create logical disks.
6. Recognize the applications for disk mirroring and be able to implement.
7. Use the system installer (INSTL) to install a starter system onto a logical disk.
8. Perform the initial startup, or boot of a starter system, including the initial load of system files.

7.67



CS-05872

Figure 3.1

How Data General Software Gets to the Customer

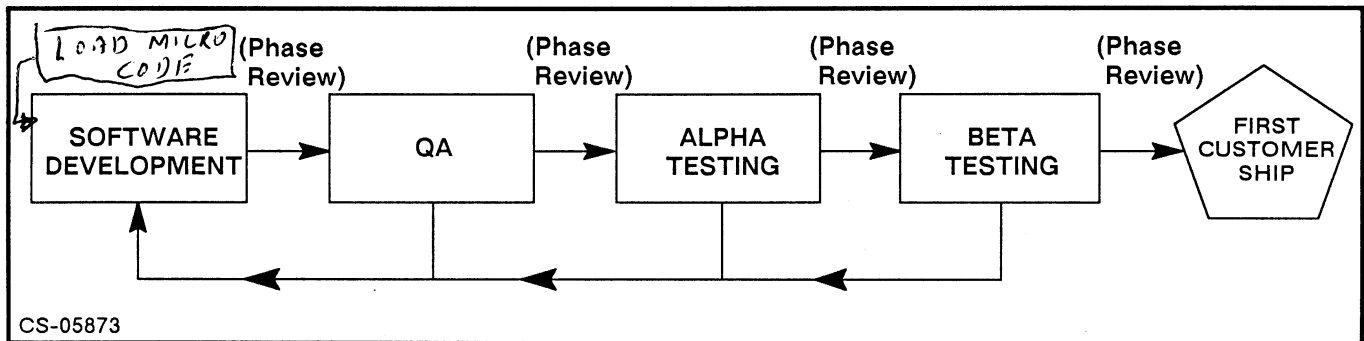
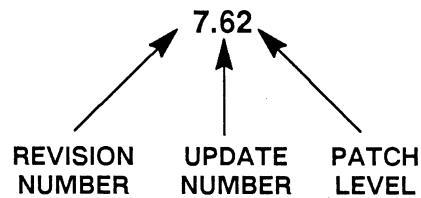


Figure 3.2 Data General Software QA Cycle

Software AOS/VS Revision Numbers



- **Revision** – Major functionality change or enhancement
- **Update** – Big but not always major
- **Patch** – Bug fixes, minor functionality changes, enhancements

LOAD MICRO CODE

AOS/VS Standard Release Tapes

MV10000-III.MCF

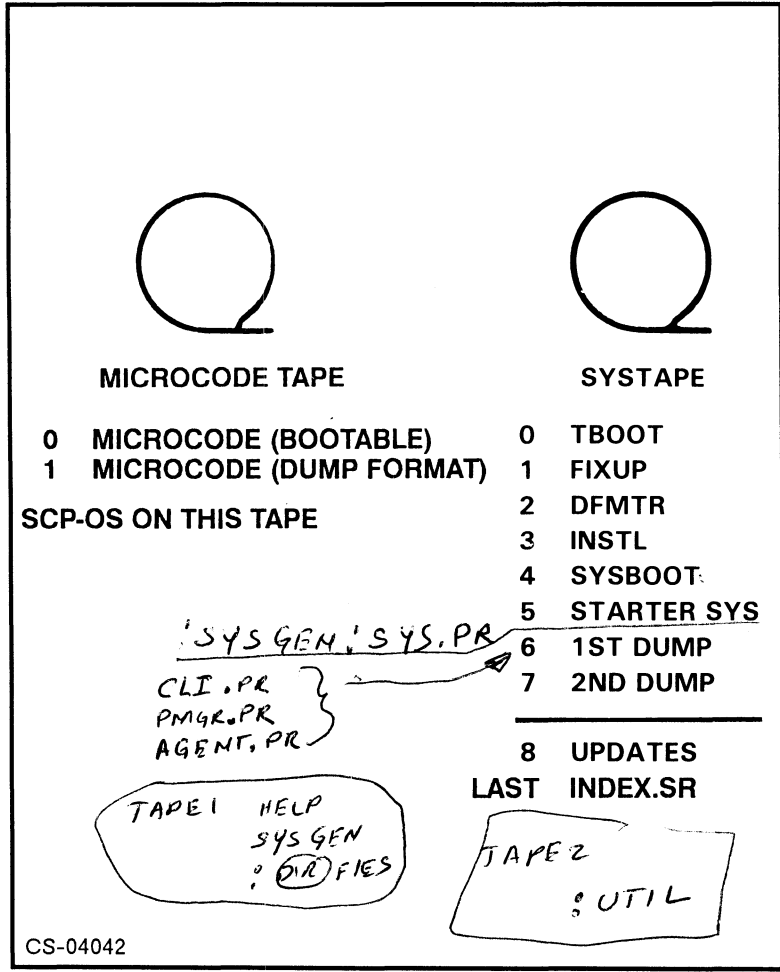


Figure 3.3

Initial System Boot

- Mount microcode tape.
- Power up system, lock switch OFF.
- Enter appropriate device code for tape at prompt (@22L, !22T, etc.).
MTD = 62
- At * prompt type LOAD microcode filename.
- Microcode in memory, you're in SCP-CLI> B 2 2

LOAD B 62

Disk Operation Options

Logical Disks

- Single-disk LDU

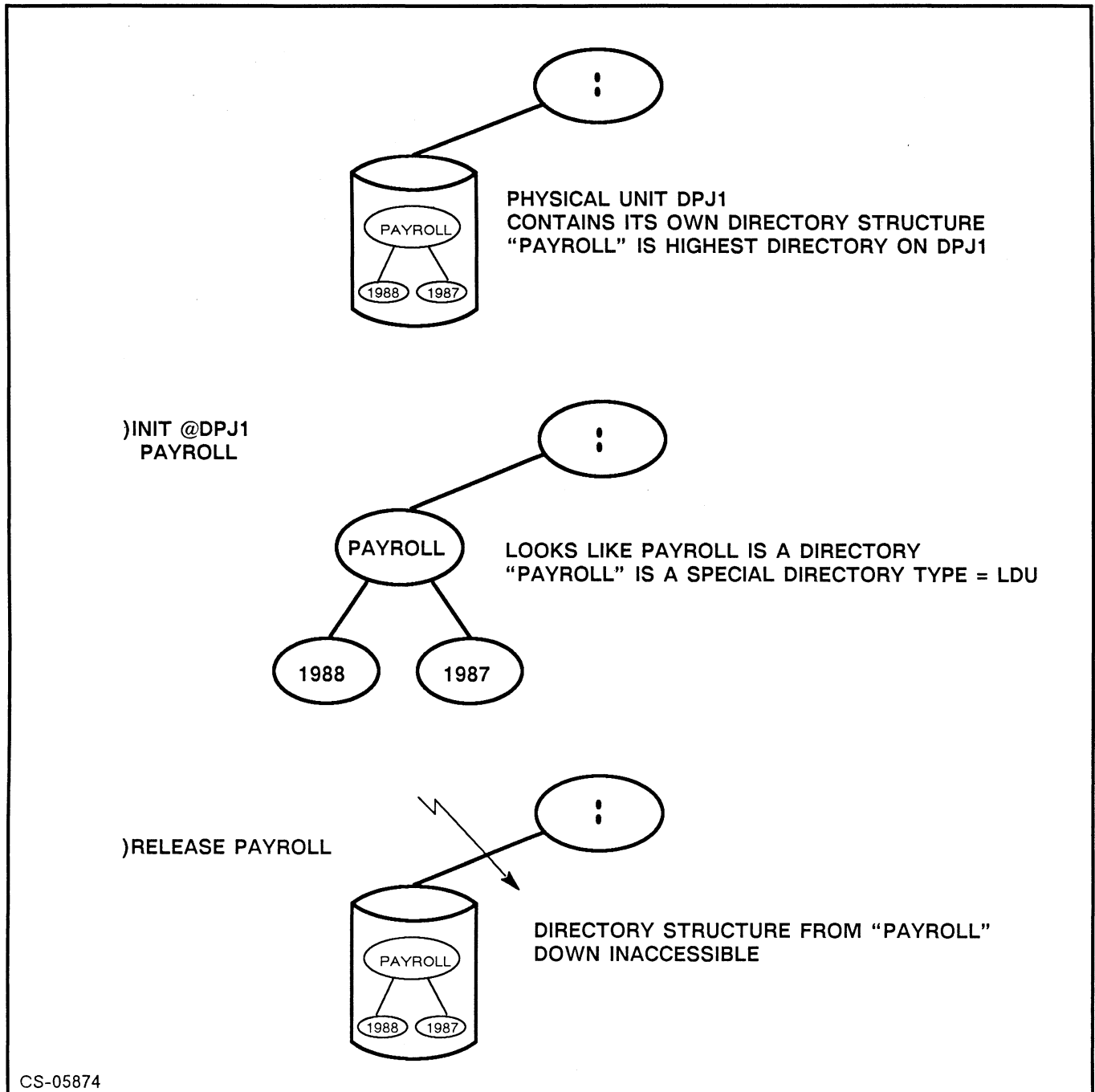


Figure 3.4

Disk Operation Options

Logical Disks

- Multi-disk LDU's

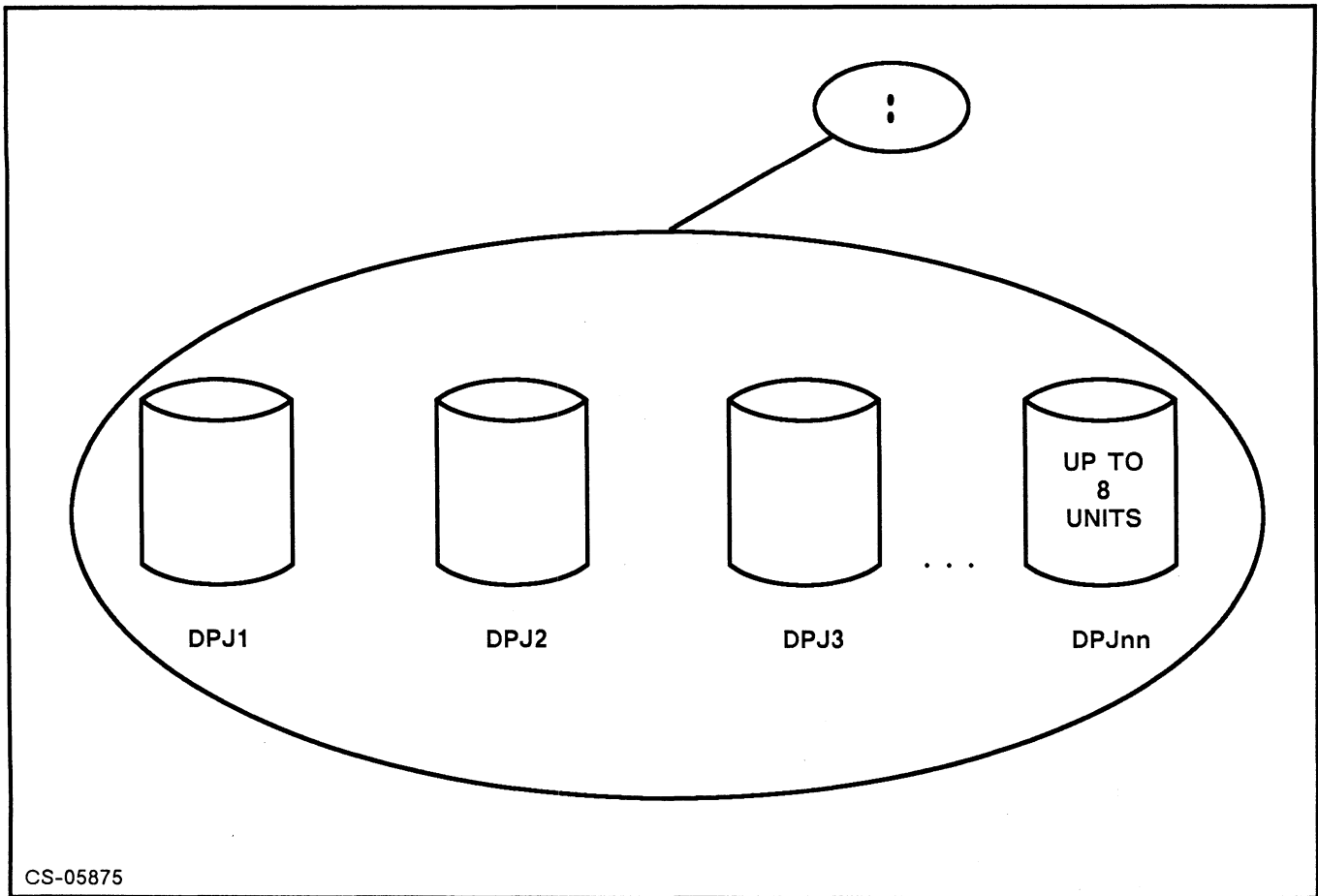


Figure 3.5

Physical units combined to make 1 larger disk have separate spindles, but are viewed as 1 disk, 1 directory. File is spread over ALL disks, no control over placement however.

```
)INIT @DPJ1 @DPJ2 @DPJ3
```

```
)RELEASE DIRECTORY NAME
```

Advantages -

Disadvantages -

Shared LDU (Dual Ported Disks)

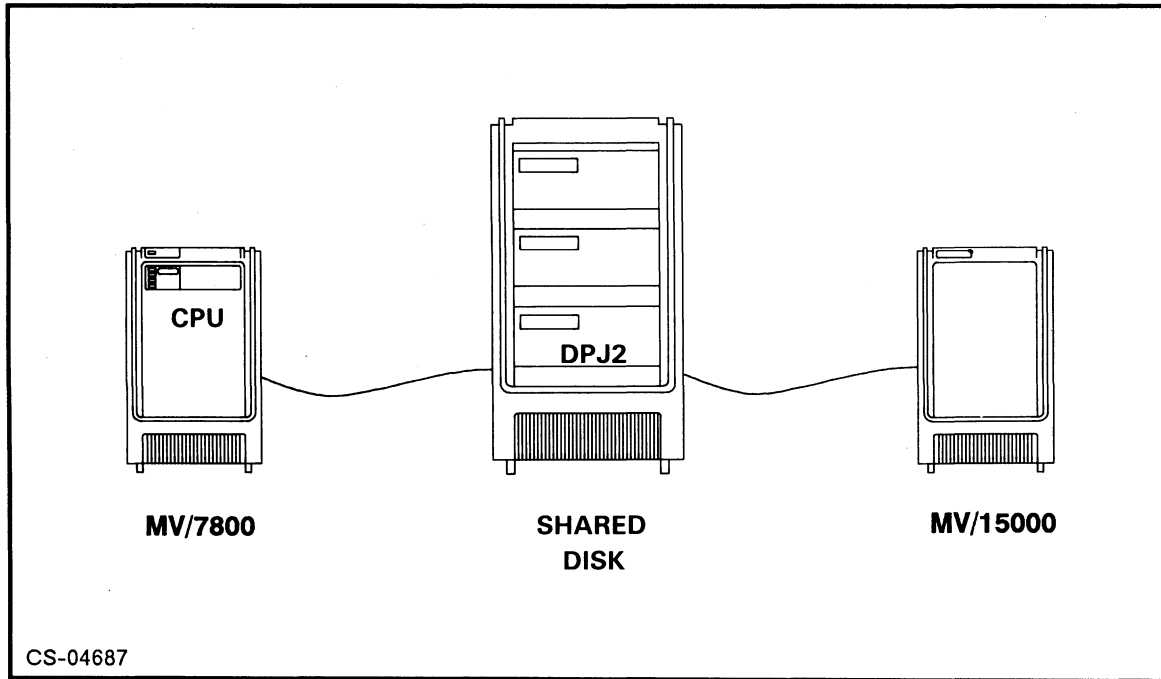


Figure 3.6 Shared LDUs

Advantages -

Disadvantages -

Restrictions -

Hardware Mirroring

- Two logical disk images treated as a single LDU.
- Higher availability of data (HA/FT).
- Write to both images.
- Read from first one available.
- Synchronized disks.
- Performance issues.

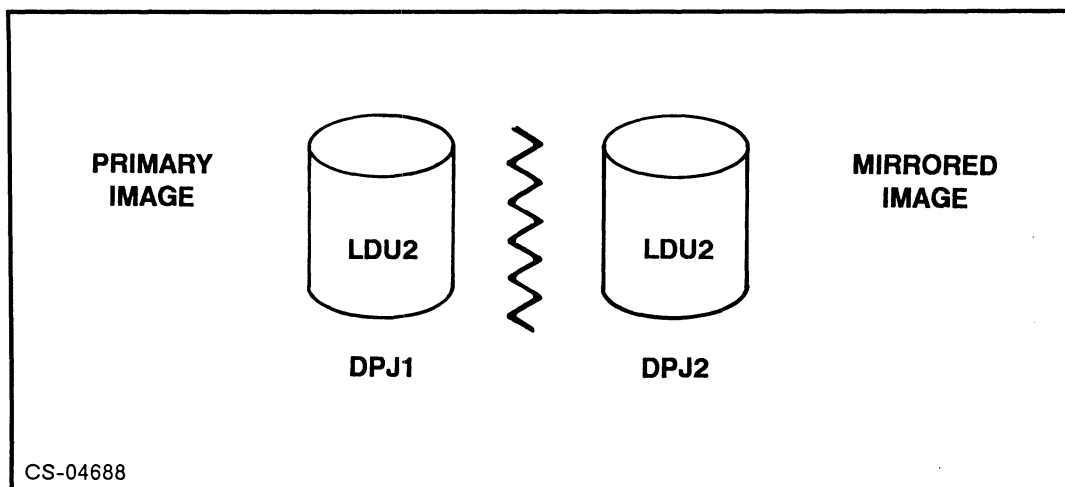


Figure 3.7 Mirroring

- Starting mirroring:
`)INIT @DPJ1!@DPJ2
LDU2`
- Synchronization:
`)MIRROR/SYNC LDU2 @DPJ2
)MIRROR/FORCESYNC LDU2 @DPJ2`
- Breaking synchronization:
`)INIT/NOMIRROR @DPJ1
LDU2`
 - AOS/VS breaks if hardware error
 - If drive is powered off

DFMTR – Disk Formatter

The formatter can be run as either a FULL or PARTIAL. Full will wipe a disk clean, where partial allows some parameters to change without destroying data.

Full Formatter

- Diagnostic area – space allocated to hold system diagnostics.
- Unique ID – ensures all physical disks of a logical disk are mounted when the disk is initialized.
- Logical disk name – name of the highest directory.
- Surface analysis – checks for bad blocks.
- Bit map – table of blocks in use.
- Overlay area – holds portions of AOS/VS, essential if Master LDU.
- Remap area – for processing of bad blocks.

BOOK KEEPING

Partial Formatter

- Change unique ID.
- Change logical disk name.
- Change ACL of root directory.
- Change bitmap address.
- Change overlay area address.
- Change remap area address.
- Read-only surface analysis.

Example DFMTR Dialogue

Single Disk, Unmirrored, with Diagnostics Area Reserved

```
SCP-CLI> RESET NL
SCP-CLI> BOOT 22 NL
Type file number? 2 NL
AOS/VS DISK FORMATTER REV n
Full format destroys and AOS/VS file structure, Partial retains it.
Full (F) or Partial (P or NEW LINE)? F NL
```

Full Format

Specify each disk in the LDU (Press NEW LINE when done)

```
Disk unit name? DPJ0 NL
Device code [24] NL
Disk unit name? NL
Do you want to allocate a diagnostic area [Y] NL
Enter the number of blocks (1750 to 35230) required. [23420] NL
```

BLOCKS = 512 BYTES

Disk number 1: 00000000000 through 00002506727

```
LDU unique I.D. (1 to 6 characters)? SYSTEM NL
LDU name (1 to 31 characters)? ROOT NL
```

*DISK 0
DISK 2*

Access Control List

```
Username or template (1 to 15 characters)? + NL
Access (O,W,A,R,E or NEW LINE) OWARE NL + E
Username or template (1 to 15 characters)?
Surface analysis? [N] Y NL
Disk number? NL
```

You may run up to five (5) patterns. How many would you like to run? 5 NL
Analyzing disk #1

```
-- Running pattern 155555
-- Running pattern 133333
-- Running pattern 066666
-- Running pattern 177777
-- Running pattern 000000
```

0 bad blocks

Additional bad block number (press NEW LINE when done): NL

```
Bitmap size: 522
Bitmap address [00000772361] NL
System disk: Y NL-
Overlay area size? [000620] NL
Overlay area address? [00000773103] NL
Disk number 1 remap area size? [000176] NL
Disk number 1 remap area address? [00000000174] NL
```

```
-- LDU created
Done!
```

```
SCP-CLI>
```

Coresident Diagnostics

- Hardware diagnostics (ADEX) now placed on disk.
- Placed in invisible area.
- ADEX area created with DFMTR.
- Installed by Field Engineer.
- RAC can run remotely.
- Limited concurrent diagnostics.

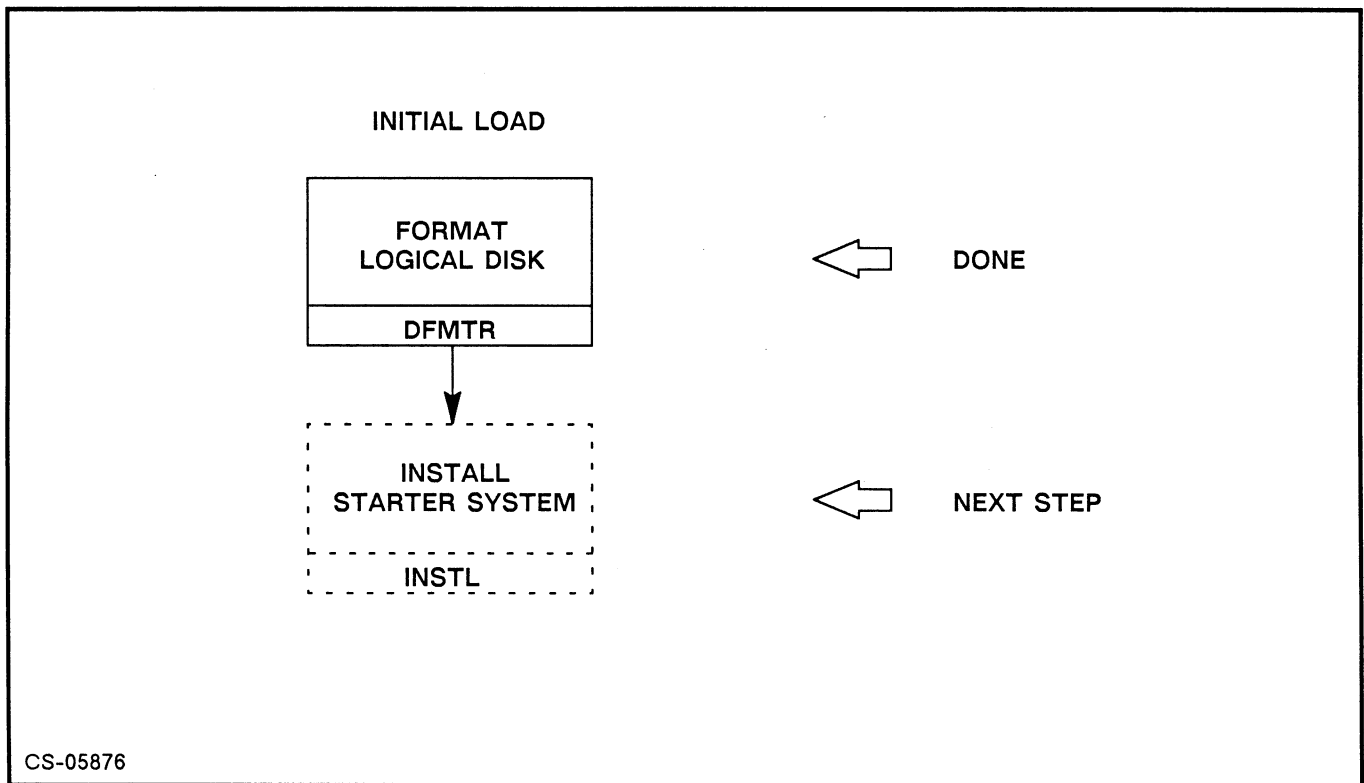


Figure 3.8

AOS/VS System Installer – INSTL

- Installs a disk bootstrap on a logical disk.
- Can install an AOS/VS SYSTEM BOOTSTRAP on the logical disk. This is the contents of file 4 of the starter tape, or your own tailored system tape.
- Can install the STARTER SYSTEM or a tailored version of an AOS/VS system on the logical disk.
- The STARTER SYSTEM is on file 5 of the starter tape.
- A tailored system is usually placed on a SYSTAPE. A systape is a tape having the same format as a starter tape. The macro to create this tape is called SYSTAPE.CLI and is found in the :SYSGEN directory.

INSTL Dialog

SCP-CLI> B 22

Tape file number? 3

AOS/VS Installer Rev n

Specify each disk in the LDU

Disk unit name? DPJ0

Device code [24] ?

-- Disk bootstrap installed

Do you want to install a System Bootstrap [Y] ?

Install from which unit [MTC0] ? MTD0

Device code [22] ?

File number [4] ?

-- System Bootstrap installed

Do you want to install a System [Y] ?

Install from which unit [MTC0] ?

Device code [22] ?

File number [5] ?

-- System installed

Done!

System Disk Layout After DFMTR & INSTL

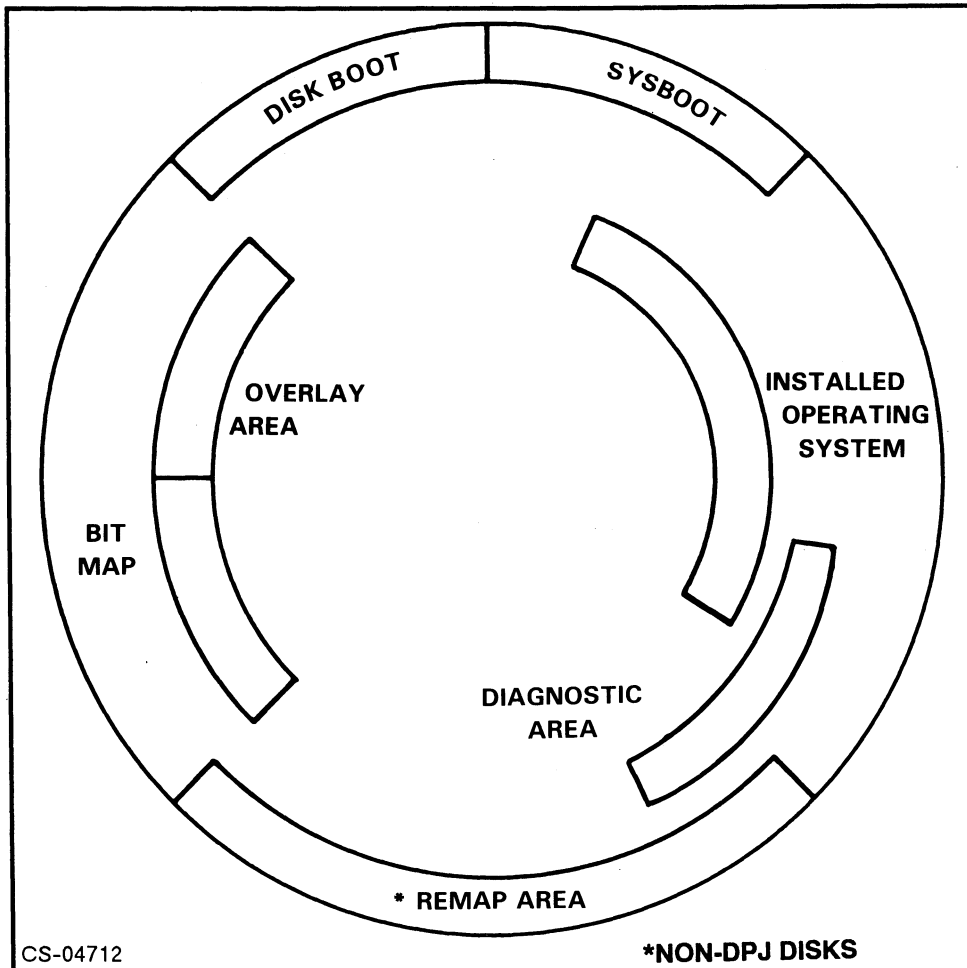


Figure 3.9

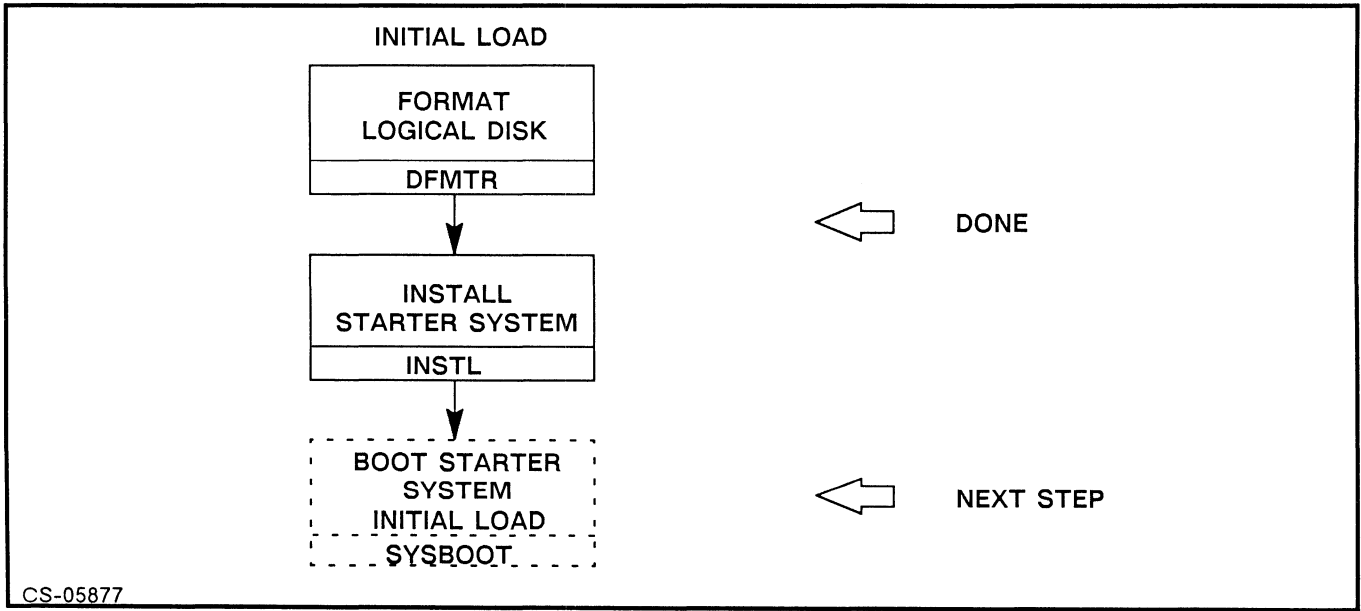
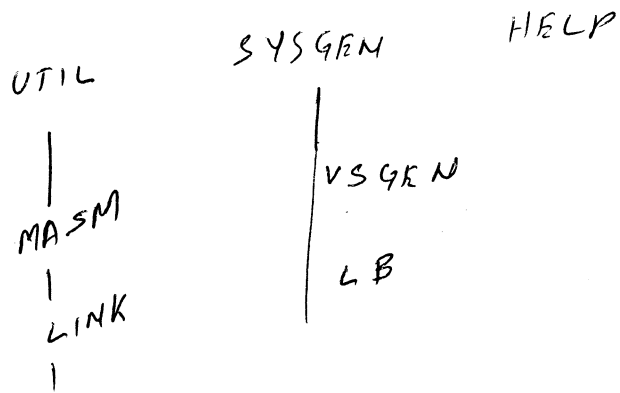


Figure 3.10



Booting the Starter System

Loading Initial Files

```
SCP-CLI> RESET NL
SCP-CLI> BOOT 24 NL
```

Operating System Load Menu

1. Continue immediately with operating system load
2. Enter the Technical Maintenance Menu

The default operating system pathname is xxxxxxxx

Enter choice [1]: NL
AOS/VS Rev nn

Master LDU: PRIMARY_MASTER

Date (MM/DD/YY)? 06 11 88 NL
Time (HH:MM:SS)? 15 30 00 NL
Override default specs [N] ? Y NL

Note: Date and time are not asked on machines with external battery-backed clocks

Number of buffers in cache [128]? NL

Swap directory definition [2000]? NL

Page directory definition [2000]? NL

Initial load [N] Y NL

*with out PMGR
CLI
AGEND* *ANS YES*

Filename [MTC0:6]? NL

....(loading proceeds)

```
AOS/VS CLI  REV XX.XX.XX.XX  DD-MMM-YY  HH:MM:SS
) SUPERUSER ON
*) LOAD/V/DELETE @MTC0:7
*) REWIND @MTC0
```

.... Now get the microcode tape and load it on the tape drive. You are
.... going to load the MICROCODE file onto the disk.

```
MD50-1
*) LOAD/V @MTC0:1 ok
MV20000.MCF
```

MV/20000 Microcode Example

Creating a Tailored System

System Hardware Configuration

Before you can start generating a system, you should know what devices will be associated with this system, and the device codes.

- System console
- User consoles *←*
- Disk controllers
- Tape controllers *▶*
- Line printers *-- 1*
- Battery backup *N/O*
- Asynch communication controllers *IACS*

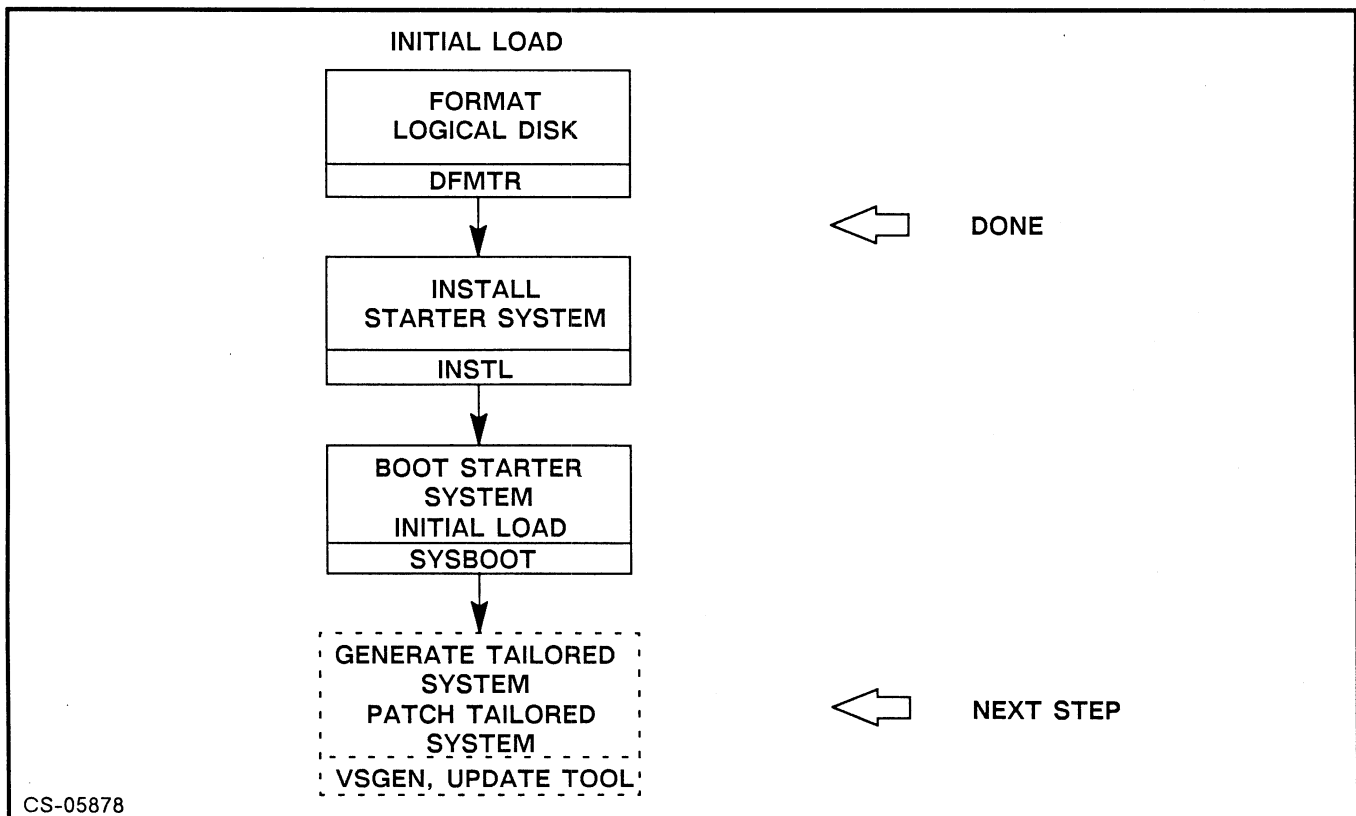


Figure 3.11

MODULE 4

System Generation and VSGEN

Objectives

Upon completion of this module, the student should be able to:

1. Create a tailored operating system using VSGEN.
2. Apply system patches with the patch utility.
3. Create a new systape.
4. Apply new revisions of AOS/VS with the UPDATE utility.
5. Maintain the system error message file ERMES.

VSGEN

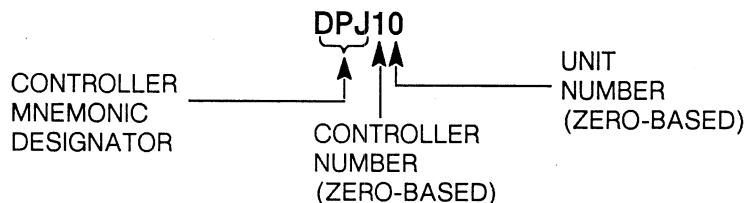
VSGEN is a maintenance program for the AOS/VS system spec file. It is used to:

- Create a custom system from the default starter system
- Add, delete or edit controller parameters
- Specify global AOS/VS runtime parameters

Since VSGEN is based on controllers, it is necessary to know your hardware before you begin. Each controller has a unique identifier called a device code. Examples:

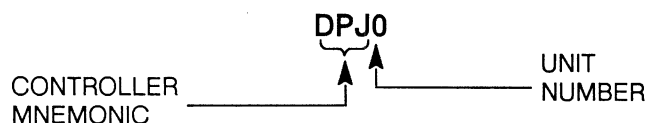
Description	Mnemonic	Dev Code
600 LPM high speed printer	LPB	17
592 MB Argus disk drive	DPJ	24
800/1600 BPI Mag tape drive	MTB	22
Async comm controller	IAC	50
147 MB Kismet disk	DPF	27

Naming Conventions



DPJ10 is the first disk unit, second controller.

EXCEPTION:



The first controller, (0), is not listed.

Files Created During VSGEN

Filename	Description
SYSTEM_NAME.SSF	The system specification file. A new AOS/VS system may be generated in batch mode using this file.
SYSTEM_NAME.CSF	Printable customer specification file detailing the configuration generated.
SYSTEM_NAME.CONFIG.pid.TMP	The assembly language source code macros which represent the system to be generated.
SYSTEM_NAME.KS_IN.pid.TMP	The @INPUT file used by CLI during system generation.
SYSTEM_NAME.KS_OUT.pid.TMP	The @OUTPUT file used by CLI during system generation.
SYSTEM_NAME.PR	The actual operating system.
SYSTEM_NAME.ST	The symbol table file created by the LINK phase of the system generation.

VSGEN

Intelligent Asynchronous Controllers (IAC)

The IAC is used to connect user comm lines into the computer. A CRT, printer or plotter can be attached to the IAC using one of the standard cabling conventions (RS-232, RS-422, RS-449, 20mA).

- IAC's can have 8, 12, or 16 lines.
- IAC's are polled top (line 0) to bottom.
- Low line numbers get higher IAC priority.
- Place power typists at top of IAC.
- Place printers or single-character I/O users at bottom.
- Balance load across IAC's, spread users and usage evenly.
- Fill IAC-8's when possible.
- Use an IAC MAP to keep track of the IAC's.

IAC TYPE: 8 / 12 / 16 (Circle one)

DEVICE MNEMONIC _____ DEVICE CODE _____

.....
Device User
Line # Con # Username Type Type Usage Comments

Line #	Con #	Username	Type	Type	Usage	Comments
0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

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Figure 4.1 IAC Map

IAC Map Field Explanation Codes

Device Type

T - Terminal
R - RAC

P - Printer
M - Modem

PC - Any PC

User Type

P - Programmer
M - Manager
G - Graphics

W - Word Processor
I - Data Inquiry
C - CEO

D - Data Entry
OP - Operator
S - Decision Base

Usage

H - Heavy

M - Medium

L - Light

I - Infrequent

Comment Examples

- Always complaining
- No problems
- 10 second response
- One minute logon
- Heavy compiling
- Heavy spreadsheet
- Moderate PRESENT with graphics
- Modem line

IAC's and VSGEN

When genning an IAC, there are two meanings to the word "line" that need to be differentiated.

- **Console Line** - The physical line numbers relative to each IAC.
- **Base Line** - A unique number assigned each of the IAC lines. Base lines are used to calculate @CONxx numbers.

$$(\text{Base line \#}) + 2 = @\text{CONxx}$$

This example uses an IAC-8, followed by two IAC-16's.

	FIRST IAC (IAC)	SECOND IAC (IAC1)	THIRD IAC (IAC2)
PHYSICAL LINES RELATIVE TO EACH IAC BOARD	0....7	0....15	0....15
BASE LINES RELATIVE TO THE SYSTEM	0....7	8....23	24....39
@CON NUMBERS (BASE LINE + 2)	2....9	10....25	26....41

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Figure 4.2

Power Protection and VSGEN

Battery Backup Unit (BBU)

- Auto restart
- Full vs partial
- Has a specified time limit
- CPI chassis, IAC's, MCP, and fans maintained
- CPU lock switch
- VSGEN'ed as device mnemonic BBU

Power Conditioner

- Spike and surge protection
- Not VSGEN'ed

Uninterruptable Power Supply (UPS)

- Provides full power during an outage
- Costs more than a BBU or power conditioner
- DG or third party manufactured
- Not VSGEN'ed

VSGEN Procedure

- *) DIR :SYSGEN
- *) X VSGEN

WELCOME TO VSGEN-- TYPE H FOR HELP

ENTER A COMMAND: H

The following are legal commands to VSGEN:

- | | |
|---------------------------------|-----------------------------------|
| A -- Add a system device | M -- Change system model |
| B -- Build a system | N -- Change system name |
| C -- List current configuration | P -- Change system parameters |
| D -- Delete a system device | Q -- Quit this session |
| E -- Edit a system device | S -- Create a spec file |
| L -- List a system device | V -- Verify current configuration |

(To receive further information about any of these commands, type H <SPACE> X, where X is any of the above commands.)

Note --

Typing "?" in response to any question will list possible responses. Separate multiple entry responses with spaces, such as:

CHARACTERISTIC WORD O: ?MST ?MSFF ?MNAS

LINES: O 3 8 11

Consecutive ATI lines should be entered as:

LINES: 15 - 37

Welcome to VSGEN -- Type H for help

Enter a command: C

Current system: none Default system: (system defaults)

System parameters:

Model:	MV/8000
Swap:	2147483647
Page:	2147483647
Cache size:	128
Minimum number system pageable pages:	10
Default file element size:	4
Frequency:	10
Access enabled:	YES
Initial program for PID 2:	CLI.PR
Initial IPC message for PID 2:	
Max program load pages - noncontention:	0
Max program load pages - contention:	0
Fault time prepaging maximum:	0
Variable swapfiles enabled:	N
Maximum swapfile size:	126
Default swapfile size:	126
Truncate swap files after use:	N
Truncate page files after use:	Y
Size above which truncation will occur:	2048
Lowest priority for group 1 processes:	255
Lowest priority for group 2 processes:	258
Soft tape errors suppressed:	N
System dump device:	MTB
Maximum number of processes:	255
System Management Interface	N
Do you wish to select Kanji Translation	N

Current System devices:

BBU CON0 DPF DPJ MTB

Optional system devices:

ATI	CPI	CPI1	CPI2	CPI3	CPI4	CPI5	CPI6	CPI7
CPI8	CPI9	CPI10	CPI11	CPI12	CPI13	CPI14	CPI15	CRA
CRA1	DKB	DKB1	DKB2	DKB3	DKB4	DKB5	DKB6	DKB7
DPD	DPD1	DPF1	DPF2	DPF3	DPF4	DPF5	DPF6	DPF7
DPG	DPG1	DPI	DPI1	DPJ1	DPJ2	DPJ3	DPJ4	DPJ5
DPJ6	DPJ7	DPM	DPM1	DRT	IAC	IAC1	IAC2	IAC3
IAC4	IAC5	IAC6	IAC7	IAC8	IAC9	IAC10	IAC11	IAC12
IAC13	IAC14	IAC15	IAC16	IAC17	IAC18	IAC19	IAC20	IAC21
IAC22	IAC23	IAC24	IAC25	IAC26	IAC27	IAC28	IAC29	IAC30
IAC31	IAC32	IAC33	IAC34	IAC35	IAC36	IAC37	IAC38	IAC39
IAC40	IAC41	IAC42	IAC43	IAC44	IAC45	IAC46	IAC47	IAC48
IAC49	IAC50	IAC51	IAC52	IAC53	IAC54	IAC55	IAC56	IAC57
IAC58	IAC59	IAC60	IAC61	IAC62	IAC63	LPB	LPB1	LPB2
LPB3	LPB4	LPB5	LPB6	LPB7	LPD	LPD1	LPE	LPE1
LPE2	LPE3	LPE4	LPE5	LPE6	LPE7	LPJ	LPJ1	LPJ2
LPJ3	MCA	MCA1	MTB1	MTC	MTC1	MTC2	MTC3	MTD
MTD1	MTJ	MTJ1	MTJ2	MTJ3	MTJ4	MTJ5	MTJ6	MTJ7
PLA	PLA1	UAC	UAC1					

Number of data channel A map slots available: 32

Number of data channel B map slots available: 27

ENTER A COMMAND: E

NAME OF DEVICE TO EDIT: CON0
CONSOLE TYPE [CRT3]: TTY
INPUT BUFFER BYTE LENGTH [128]: NL
OUTPUT BUFFER BYTE LENGTH [128]: NL
CHARACTERISTIC WORD 0 [STANDARD]: NL
CHARACTERISTIC WORD 1 [STANDARD]: ?TTY ?MULC
CHARACTERISTIC WORD 2
LINES PER PAGE [STANDARD]: 66
CHARS PER LINE [STANDARD]: 80
CHARACTERISTIC WORD 3 [STANDARD]: NL

ENTER A COMMAND: M

ENTER NEW MODEL [MV/8000]: MV/7800

ENTER A COMMAND: N

ENTER NEW SYSTEM NAME [NONE]: MYSYSTEM

ENTER A COMMAND: D

NAME OF DEVICE TO BE DELETED: DPF
DPF HAS BEEN DELETED

ENTER A COMMAND: D

NAME OF DEVICE TO BE DELETED: MTB
MTB HAS BEEN DELETED

ENTER A COMMAND: A

NAME OF DEVICE TO BE ADDED: MTD
DEVICE CODE [62]: NL
DEFAULT DENSITY [6250]: ?
NC,ADM,1600,6250
DEFAULT DENSITY [6250]: ADM
MAX BYTE TRANSFER [32K]: 32K

ENTER A COMMAND: A

NAME OF DEVICE TO BE ADDED:	IAC
DEVICE CODE [65]:	NL
IAC BASE LINE NUMBER [0]:	NL
IAC DEVICE TYPE [??]:	8
Support ANSI terminals from this IAC [NO]	
IAC SPLIT BAUD RATE [NONE]:	NL

(Lines 0-6 on this IAC8 are attached to dial-up modems for D200 compatible consoles.)

CONSOLE LINES [??]:	0 - 6
CONSOLE TYPE [CRT3]:	NL
INPUT BUFFER BYTE LENGTH [128]:	64
OUTPUT BUFFER BYTE LENGTH [128]:	512
CHARACTERISTIC WORD 0 [STANDARD]:	?MST ?MMRI ?MEOC
CHARACTERISTIC WORD 1 [STANDARD]:	?CRT3 ?MULC ?MMOD
CHARACTERISTIC WORD 2	
LINES PER PAGE [STANDARD]:	NL
CHARS PER LINE [STANDARD]:	NL
CHARACTERISTIC WORD 3 [STANDARD]:	NL
INITIALIZATION WORD [STANDARD]:	?CLN8 ?CS10 ?CR12H ?CSBDS

DO YOU WANT TO ADD ANOTHER GROUP OF LINES? [N] Y

(Line 7 on this IAC8 is attached to a Letter Quality Printer.)

CONSOLE LINES [??]:	7
CONSOLE TYPE [CRT3]:	TTY
INPUT BUFFER BYTE LENGTH [128]:	2
OUTPUT BUFFER BYTE LENGTH [128]:	254
CHARACTERISTIC WORD 0 [STANDARD]:	NL
CHARACTERISTIC WORD 1 [STANDARD]:	NL
CHARACTERISTIC WORD 2	
LINES PER PAGE [STANDARD]:	66
CHARS PER LINE [STANDARD]:	80
CHARACTERISTIC WORD 3 [STANDARD]:	?MOFC
INITIALIZATION WORD [STANDARD]:	?CLN8 ?CS10 ?CR12H ?CSBDS

DO YOU WANT TO ADD ANOTHER GROUP OF LINES? [N] NL

ENTER A COMMAND: A

NAME OF DEVICE TO BE ADDED: IAC1
DEVICE CODE [50]: NL
IAC BASE LINE NUMBER [0]: 8
Support ANSI terminals from this IAC [NO]
IAC DEVICE TYPE [??]: 16

(Lines 0 - 14 on the IAC16 are attached to D461 consoles.)

CONSOLE LINES [??]: 0 - 14
CONSOLE TYPE [CRT3]: CRT6
INPUT BUFFER BYTE LENGTH [128]: 64
OUTPUT BUFFER BYTE LENGTH [128]: 192
CHARACTERISTIC WORD 0 [STANDARD]: NL
CHARACTERISTIC WORD 1 [STANDARD]: NL
CHARACTERISTIC WORD 2
 LINES PER PAGE [STANDARD]: NL
 CHARS PER LINE [STANDARD]: NL
CHARACTERISTIC WORD 3 [STANDARD]: ?MOFC
INITIALIZATION WORD [STANDARD]: ?CLN7 ?CS10 ?CR96H ?CSBDS

DO YOU WANT TO ADD ANOTHER GROUP OF LINES? [N] Y

(Line 15 on the IAC16 is attached to a laser printer.)

CONSOLE LINES [??]: 15
CONSOLE TYPE [CRT3]: TTY
INPUT BUFFER BYTE LENGTH [128]: 2
OUTPUT BUFFER BYTE LENGTH [128]: 254
CHARACTERISTIC WORD 0 [STANDARD]: ?MST ?MSFF ?MNAS
 ?MEOC
CHARACTERISTIC WORD 1 [STANDARD]: ?TTY ?MULC
CHARACTERISTIC WORD 2
 LINES PER PAGE [STANDARD]: 66
 CHARS PER LINE [STANDARD]: 80
CHARACTERISTIC WORD 3 [STANDARD]: NL
INITIALIZATION WORD [STANDARD]: ?CLN8 ?CS10 ?CR600 ?CSBDS

DO YOU WANT TO ADD ANOTHER GROUP OF LINES? [N] NL

Enter a command: P

Swap [2147483647]: NL
Page [2147483647]: NL
Cache [128]: 1024 NL
Minimum number system pageable pages [10]: 50
Default file element size [4]: NL
Frequency [10]: NL
Access [YES]: NL
Initial program for PID 2 [CLI.PR]: NL
Initial IPC message for PID 2 []: UP.CLI NL
Max program load pages - noncontention [0]: NL
Max program load pages - contention [0]: NL
Fault time prepaging maximum [0]: NL
Do you wish to use variable swapfiles [N]: NL
Do you wish to truncate swap files after use [N]: NL
Do you wish to truncate page files after use [Y]: NL
Size above which page files will be truncated [2048]: NL
Lowest priority for group1 processes [255]: NL
Lowest priority for group 2 processes [258]: NL
Suppress soft tape error reporting [N]: NL
Default system dump device [MTB]: MTD NL
Maximum number of processes [255]: NL
Do you wish to use the System Management Interface [N]: NL
Do you wish to select Kanji Translation [N]: NL

ENTER A COMMAND: A

NAME OF DEVICE TO BE ADDED: LPB
DEVICE CODE [17]: NL

ENTER A COMMAND: V

(Configuration verified)

ENTER A COMMAND: B

CREATING SPECIFICATION FILE

DO YOU WANT TO SAVE TMP FILES? [Y] NL

SYSTEM BUILD IN PROGRESS

SYSTEM BUILD PHASE COMPLETED

ENTER A COMMAND: Q

)

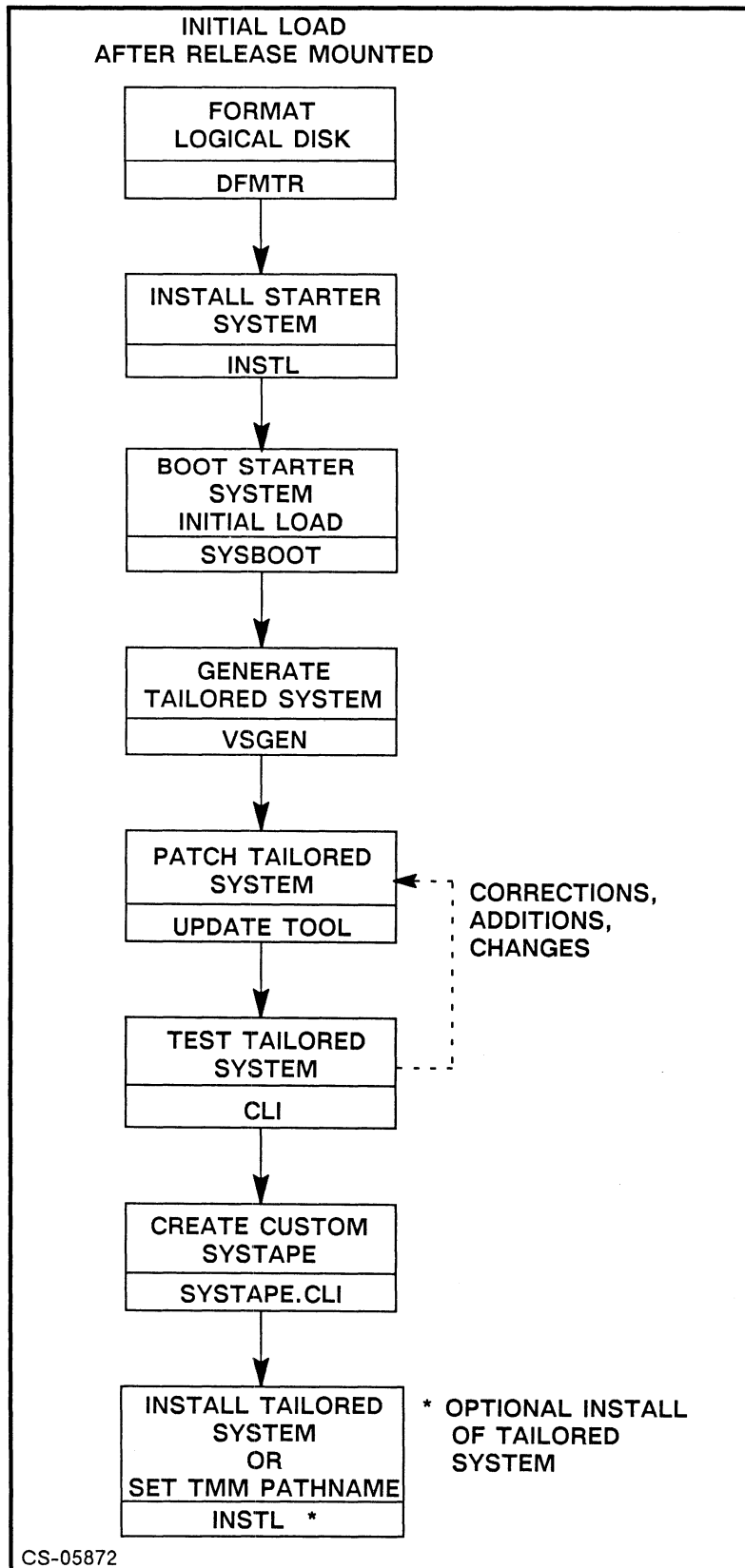


Figure 4.3

Updating a Tailored System

The UPDATE tool is used to apply any patches required to the tailored system created with VSGEN. UPDATE uses an enclosed script file to move files from the revision directory to the proper AOS/VS directory. Then it performs the patching.

)UPDATE/REV=7.62 (Updates everything except AOS/VS)

)X VSGEN (Creates your tailored system)

)UPDATE/REV=7.62/SYSTEM :SYSTEM:MYSYSTEM.PR (Updates tailored system)

You are now ready to install your custom system if desired.

- UPDATE requires no interaction; it may take from 25–90 minutes.
- UPDATE creates a log directory called X.XX_DDMMYY_HHMM.LOG.
- Abbreviated example of UPDATE.LOG found in above log directory:

```
02-OCT-88                      Update Log File                      15:27:22
update command: :UPDATE:UPDATE/REV=7.62:SYSGEN:MV7800.PR
*****
update directory = :UPDATE
rev directory = :UPDATE:7.62
root directory = :
log directory = :UPDATE:7.62_02OCT88_1526.LOG
update script = :UPDATE:7.62_UPDATE_SCRIPT.CLI
AOS/VS system file = :SYSGEN:MV7800.PR
Validating the commands in update script.
Validating "update_move/dir =: CLI.OL CLI.PR CLI.ST"
Validating "update_move/dir =: ERMES"
Validating "update_move/dir =: FIXUP FIXUP.ST"
Validating "update_move/dir =: HELP CLI.TPC.SED"
Validating "update_move/dir =: UTIL 069_000031_02"
Validating "update_move/dir =: UTIL AOSVS.PANICS.SR"
Validating "update_move/dir =: UTIL AOSVS_UPDATE_NOTICE"
:UPDATE:7.62_UPDATE_SCRIPT.CLI validation complete.
Performing the commands in update script.
Performing update_move/dir=: ALPHARS.PR ALPHARS.ST"
Performing "update_move/dir=: CLI.OL CLI.PR CLI.ST"
Performing "update_patch/patch=7.62_AOSVS_PAT AOS/VS"
Performing "update_move/dir=: AGENT.PR AGENT.ST"
:UPDATE:7.62_UPDATE_SCRIPT.CLI complete.
```

Patch Utility

Should you ever need to apply a patch to a program or system.PR file, it is necessary to use the PATCH utility.

)X PATCH/Y/P=patch_filename/T=file_to_be_patched

It APPLIES ALL PATCHES

ERMES

All of the Data General products come with some error message handling file. A few have their own, but most others have their messages in a .OB file. These .OB's must be linked with AOS/VIS modules to form the system error message file ERMES, found in :.

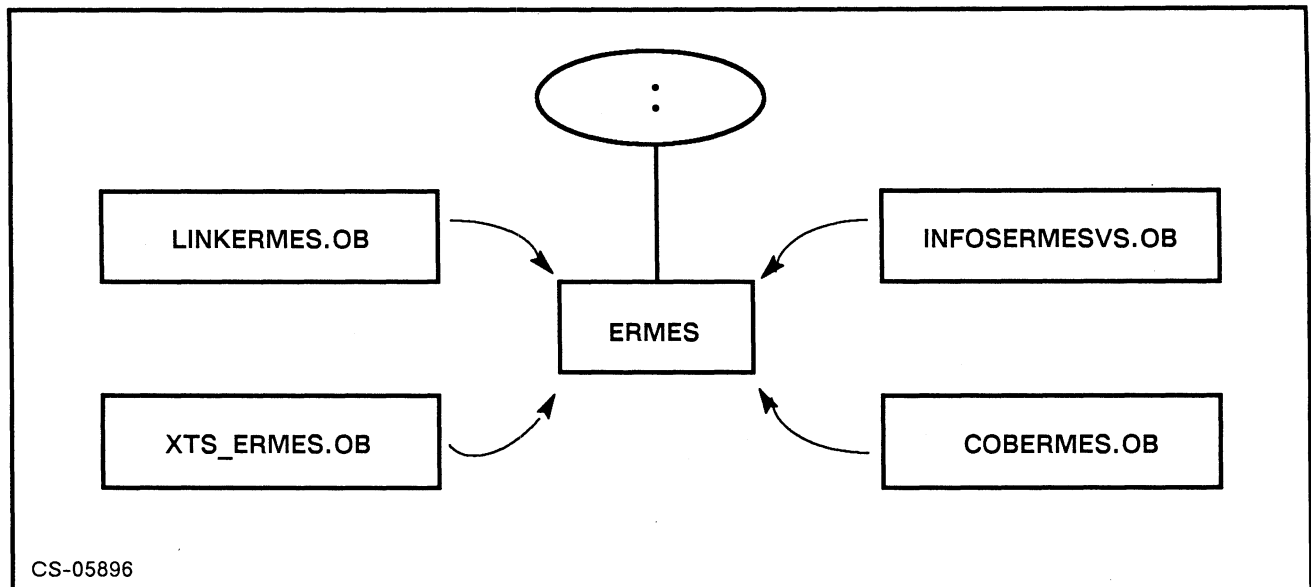


Figure 4.4

The LINK_ERMES.CLI macro supplied with the system is used to include new .OB files for any products added. It is a good idea to make a copy of this macro, call it CUSTOM_ERMES.CLI, and use that in the future. This new macro can be edited as more products come on the system. New products get added between the angle brackets in the macro.

Testing the New, Tailored System

Shut Down the Starter System

Boot the new system:

```
SCP-CLI> RESET
SCP-CLI> BOOT 24
```

Operating System Load Menu

- 1 Continue immediately with operating system load
- 2 Enter the Technical Maintenance Menu

...

```
Enter choice [1]: 2 NL          (Choose option 2)
                Technical Maintenance Menu
```

...

- 6 Run a specified program

...

```
Enter choice [1]: 6 NL          (Choose option 6)
Pathname? :SYSGEN:MYSYSTEM.PR NL
```

```
Date (MM/DD/YY)?                (Enter date; for example, 5 23 88 NL )
```

```
Time (HH:MM:SS)?                (Enter time; for example, 16 30 NL )
```

```
Override default specs [N]?
```

A pause occurs here, then

```
AOS/VS CLI REV n date time
)
```

Test the system for awhile, by performing CLI operations and maybe running a program or two. Compiles are a good test.

Creating a Custom Systape

- Created to provide an easy recovery in the event of a catastrophic media failure on the master device.
- Can also be used to generate custom “Release Tapes” for third party software releases; that is...from an OEM to a customer.
- Data General Corporation supplies a basic SYSTAPE macro in the :SYSGEN directory. Files created on tape are as follows:

Tape File #	Contents
0	TBOOT
1	FIXUP
2	DFMTR
3	INSTL
4	SYSBOOT
5	your_tailored_system.PR
6	First DUMPFIL
7	:SYSGEN:# :UTIL:# :HELP:# (DUMP format)

- You can modify the macro to exclude any files you wish.
- You can create a CUSTOM_SYSTAPE macro that puts whatever you feel is necessary on the tape, patterned after the Data General SYSTAPE macro.

Applying New Revisions

The steps to install a new revision are similar to the initial install. DFMTR need not be run, and you will not have to answer the VSGEN dialogue questions again. These are the steps necessary:

1. If contracted for support, contact the support center for problems/warnings on the new software. Consult the On-Line Information System if available to you. READ THE RELEASE NOTICE.

LOAD-II

2. Be sure you have the correct version of the microcode before starting the process. *MUST*

3. Install the new revision SYSBOOT and starter system, by booting INSTL from the *sys boot* release tape.

BOOT ANEMIC BOOT SYS

4. Boot the new starter system and perform the INITIAL LOAD. *PMGR
AGEND*

5. Load down the microcode file from file 1 of the microcode tape.

6. Generate the tailored system with VSGEN:

DEF = SYS NAME

) X VSGEN/B=system_name

7. Make a new ERMES file with the ERMES macro you created.

*LINK ERMES
: DIRECTORY*

8. Create a new SYSTAPE for this revision, and possibly a backup SYSTAPE at the same time.

DUMP-II/ FILES 1-5

9. Reset or change the LOCK_CLI password. (Covered in a later module.)

Changing Your System Spec File at a Later Date

- Outline changes to be made
- Create a new system using the old spec file

`)X VSGEN/DEF=system_name`

Caution: Failure to specify a system name gives you the starter system. Do not overwrite old system file or delete files from CLI.

RUN UPDATE USING PATCH

- Shut system down
- Reboot using new system
- Test your new system and changes, then patch
- When appropriate, make the new system the default
- Delete old system files at this time

MODULE 5

EXEC Functions

Objectives

Upon completion of this module, the student should be able to:

1. List the functions of EXEC.
2. Start up the EXEC process.
3. Describe how the operator and the users communicate with EXEC.
4. Create user profiles using PREDITOR.
5. Use and control the features of the EXEC LOG-ON function.
6. State the purpose of a queue.
7. Show the relationship among queues, spooler (cooperative) processes, and devices.
8. Create any desired configuration of queues and spooled devices using EXEC commands.
9. Create and utilize special forms specifications.
10. Control the batch function using EXEC commands.
11. Create customized UP and DOWN macros.

EXEC Utility

The major functions of EXEC are:

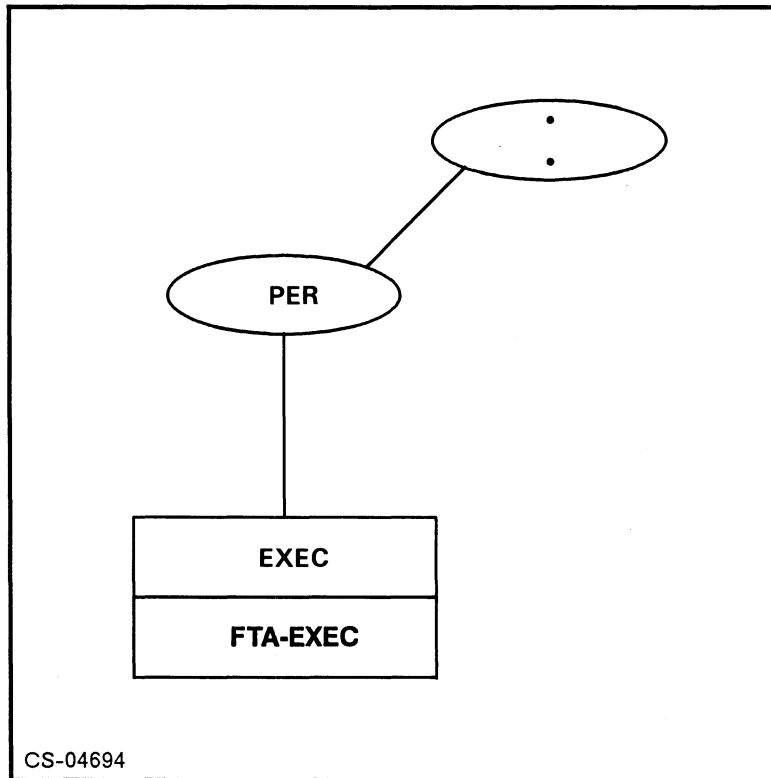
- LOGON - Control through user profiles
- SPOOLING - Enabling multi-user printing, plotting
- BATCH - Managing jobs run without consoles
- MOUNT - Assisting in labeled tape management

*PERIPHERALS
DIRECTORIES
- SON PRIVILEGES*

*@ DIRECTORY
EXEC IPC
EXEC REQUEST*

Starting up EXEC

) PROC/DIR=@/DEFAULT/NAME=EXEC EXEC



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Figure 5.1 EXEC Utility

Communicating with EXEC

Since the EXEC process has no console, the operator uses the CLI CONTROL command to issue commands to EXEC. Only certain processes can communicate with EXEC.

```
) CONTROL @EXEC exec-command  
) CE exec-command or CX exec-command
```

EXEC replies to commands with a SEND, to the console issuing the request. UNSOLICITED messages go to the master console.

```
FROM PID 3: (EXEC) hh:mm:ss
```

To eliminate these prompts, the operator must issue:

```
) CONTROL @EXEC PROMPTS OFF  
EXEC
```

Help for EXEC Commands

To get help on any EXEC command, use the XHELP macro:

```
) XHELP exec-command
```

EXEC Logging

To start logging EXEC activity and place entries in a file:

```
) CONTROL @EXEC LOGGING/START pathname
```

Procedure for Logon

EXEC will monitor consoles when directed, and display the logon BANNER if present, or the SYSID. When a NL, CR, ERASE EOL, or ERASE PAGE is pressed, EXEC displays:

AOS/VS NN.nn.nn.nn /EXEC NN.nn.nn.nn DD-MMM-YY HH:MM:SS @CONnn

Username:

Password:

VALID Username/Password Entered

- LOGON is acknowledged.
- :UTIL:LOGON.MESSAGE displayed if it exists.
- Last log-on date/time listed.
- Initial program for the process executes.
- Initial IPC macro invoked, if applicable.

INVALID Username/Password Entered

- Invalid username – password pair is displayed.
- Username: prompt reappears.

Changing a Password

- Terminate password with a CTRL-L or ERASE PAGE.
- Enter new password when prompted.
- Re-enter new password for confirmation (neither echoed).

Log-On Function Control Commands and Examples

Command	Description
ENABLE	Directs EXEC to start monitoring a console for logon.
DISABLE	Directs EXEC to stop monitoring a console for logon.
TERMINATE	Logs the user off of the console. <i>DISABLE</i>
CONSOLESTATUS	Indicates which consoles are ENABLED and who is on them.

EXAMPLES

```
)CE ENABLE/TRIES=5/CONTINUE @CON5
```

```
)CE ENABLE/TRIES=3/STOP @CON(2 3 4 12 16 23 40)
```

```
)CE ENABLE/TRIES=3/FORCE/STOP ([CONSOLE_LIST])
```

```
)CE ENABLE/ALL
```

Sample ENABLE Macro

COMMENT ENABLE.CLI macro for Washington Education Center

COMMENT Called from :UP.CLI

COMMENT *** Classroom #1 IAC ***
CONTROL @EXEC ENABLE @CON(2 3 4 5 6 7 8 9 10 11)

COMMENT *** Classroom #2 IAC1 ***
CONTROL @EXEC ENABLE @CON(18 19 20 21 22 23 24 25 26 27 28 29)
COMMENT *** Classroom #2 IAC2 ***
CONTROL @EXEC ENABLE @CON(34 35 36)

COMMENT *** Computer Room Lab IAC2 ***
CONTROL @EXEC ENABLE @CON(38 39 40 41 42 43 44 45 46 47 48 49)

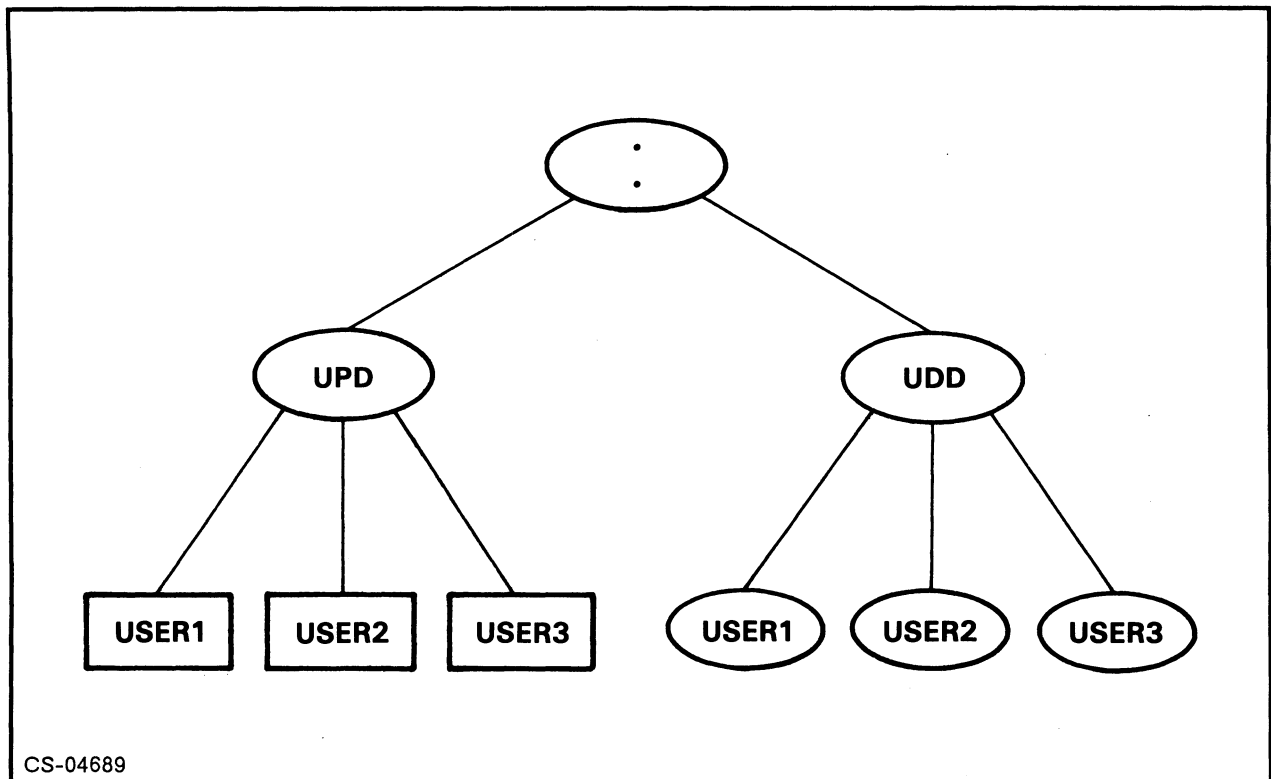
COMMENT *** Classroom #3 IAC3 ***
CONTROL @EXEC ENABLE @CON(50 51 52 53 54 55 56 57 58 59 60 61 62)

COMMENT *** Office Area IAC1 ***
CONTROL @EXEC ENABLE/TRIES=3/STOP @CON(30 31)

COMMENT @CON65 is used for an LQP -- NEVER ENABLE!!

Profiles

- Assigned by username.
- File type UPF stored in :UPD.
- Created by PREDITOR.PR.



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Figure 5.3 Profiles

PREDITOR – Profile Editor

- Used to build and maintain user profiles.
- SUPERUSER privilege is required in profile to run PREDITOR.
- To initiate a session:

)X PREDITOR

PREDITOR responds with:

AOS/VS User Profile Editor Rev 07.62 6-Oct-88 8:23:39
Command: HELP

The legal commands are:

Bye

Create

Delete

Edit

Help

List

Question (turn questions on or off)

Rename (rename profile & user directory)

Use (use another profile as !DEFAULT!)

Command: C
 Username: SUE.PROG
 Password change? (Y or NL) Y
 New (6-15 chars): SIX FLAGS
 Encrypt password [No]? (Y, N, or NL) Y
 Initial IPC file [] change? (Y or NL) Y
 New (0-63 chars): :UDD:SUE.PROG:LOGON.CLI
 Program [CLI.PR] change? (Y, or NL)
 Create without block [No]? (Y, N, or NL) Y
 Use IPC [No]? (Y, N, or NL) Y - FOR OP ONLY
 Use console [Yes]? (Y, N, or NL)
 Use batch [Yes]? (Y, N, or NL)
 Use virtual console [Yes]? (Y, N, or NL) - NO ?
 Access local resources from remote machines [Yes]? (Y, N, or NL) ?
 Change password [Yes]? (Y, N, or NL)
 Unlimited sons [No]? (Y, N, or NL) - NO
 Sons [1] change? (Y or NL) Y 10
 New (0-1023): 5
 Change priority [No]? (Y, N, or NL)
 Change type [No]? (Y, N, or NL)
 Change username [No]? (Y, N, or NL) NO NO NO FOR ALL EXCEPT OP
 Access devices [No]? (Y, N, or NL)
 Superuser [No]? (Y, N, or NL) NO NO NO
 Superprocess [No]? (Y, N, or NL)
 System Manager privilege [No]? (Y, N, or NL)
 Modem [No]? (Y, N, or NL) Y NO TO ALL
 Change address space type [No]? (Y, N, or NL) Y YES
 Change working set limit [No]? (Y, N, or NL) MINOR
 Priority [2] change? (Y or NL) - OR
 Max qpriority [0] change? (Y or NL) Y
 New (0-255): 127
 Disk quota [500] change? (Y or NL) Y
 New (0-2147483647): 20000 -
 Logical address space - batch [-1 system default] change? (Y or NL)
 Logical address space - non-batch [-1 system default] change? (Y or NL)
 Minimum working set size - batch [-1 system default] change? (Y or NL)
 Maximum working set size - batch [-1 system default] change? (Y or NL)
 Minimum working set size - non-batch [-1 system default] change? (Y or NL)
 Maximum working set size - non-batch [-1 system default] change? (Y or NL)
 Default user locality - non-batch [0] change? (Y or NL) CLASS 1, 2, 3, 4
 Use other localities - non-batch [No]? (Y, N, or NL) 500-1000
 User comment [] change? (Y or NL) Y
 New (0-79 chars): PROFILE CREATED 10/6/88 JC

Command: R
 Username: SUE.PROG
 New username: SUE.MGR

Command: D
 Username: SUE.MGR
 Delete user 'SUE.MGR'? (Y or N) Y
 User deleted
 Delete user directory ':UDD:SUE.MGR'? (Y or N) Y
 User directory deleted

Command: B
 Terminating 6-Oct-88 8:28:19

DIR : UDD
 UDD:1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100
 5-10

Spooling

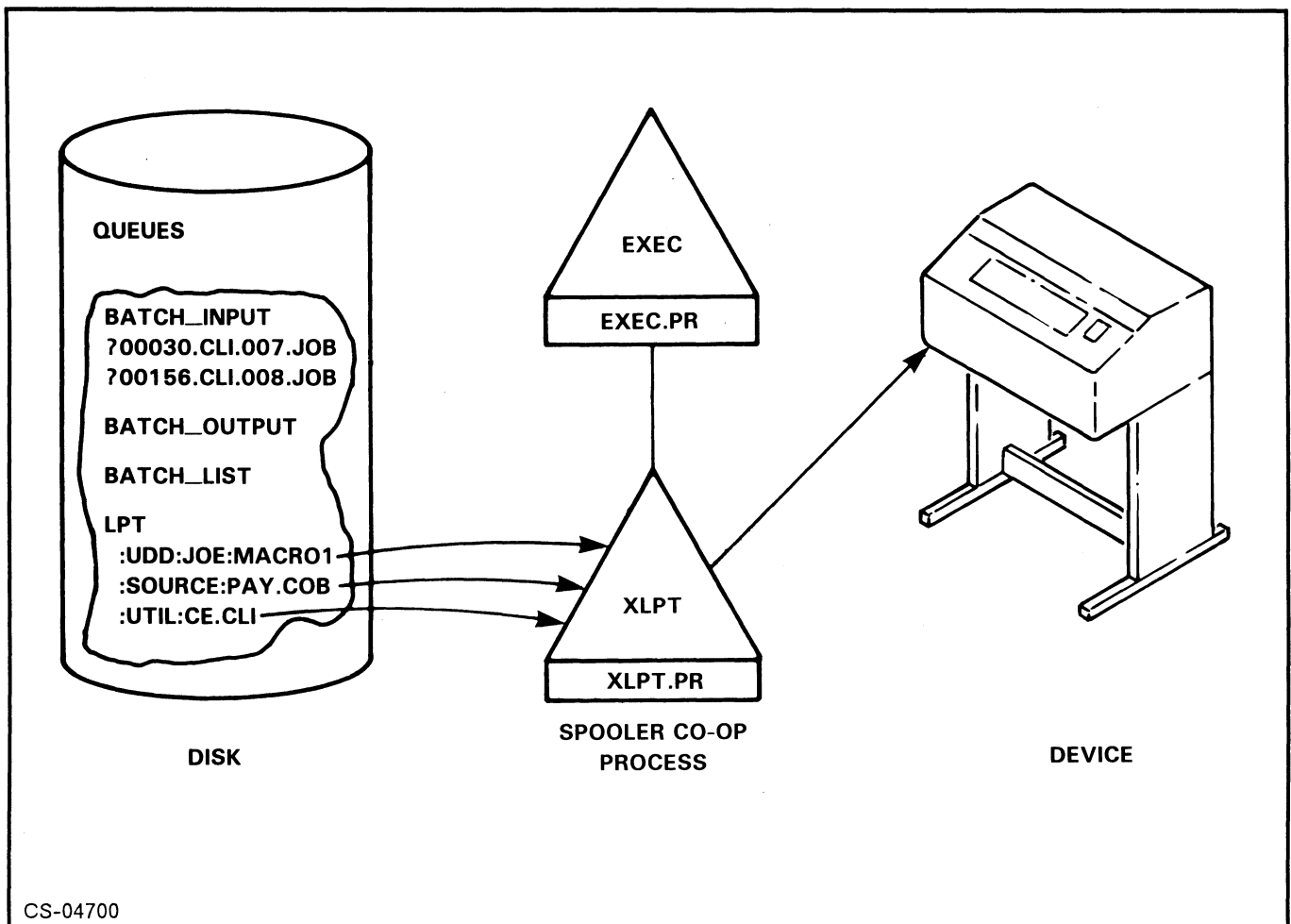
CLI.

The EXEC spooling feature allows multiple users to gain access to an output device through the use of a queue without being pended while their request is serviced.

Simultaneous Peripheral Operations On Line

Accessing Spooling Co-operatives

- User submits through a command like QPRINT.
- Queue name referenced in CLI command or program.
- One spooler can handle up to 15 devices.



CS-04700

Figure 5.4 Spooling Command Relationships

Queues

- EXEC can maintain 256 queues. *IN Q-DESCRIPTION*
- EXEC can hold 32767 waiting requests simultaneously. *} QUEUE ENTRIES*
- No more than 1024 requests can be in a queue.

Queue Types

- PRINT
- BATCH
- FTA
- MOUNT
- HAMLET
- SNA
- PLOT

Queue Entries

Queue entries consist of pathnames only, and this information:

- Sequence number
- Priority
- Page limits
- Forms
- Time to print
- Username
- Date/time of entry to queue
- Status
- Number of copies

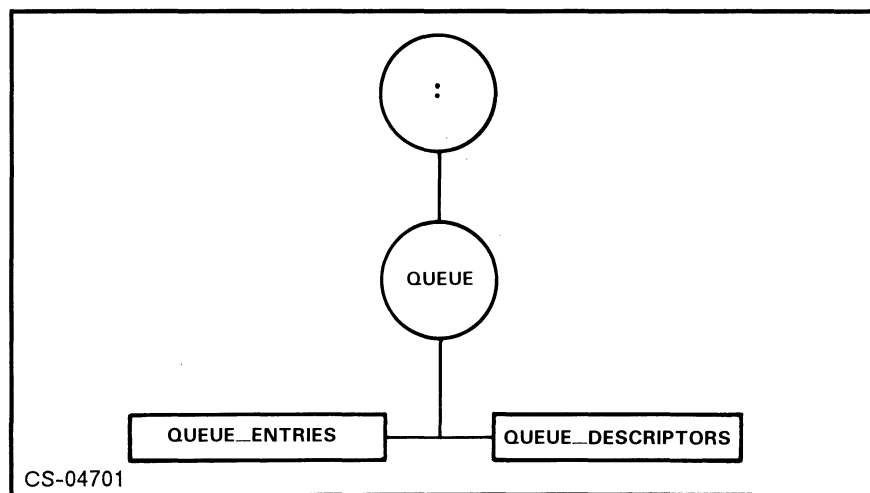


Figure 5.5 Queue Directory Structure

Predefined Queues

Queuename	Type	Requests
BATCH_INPUT	BATCH	Files to run as batch jobs
BATCH_OUTPUT	PRINT	Files from completed batch jobs
BATCH_LIST	PRINT	List files from completed batch jobs
MOUNTQ	MOUNT	Mount requests

LPT

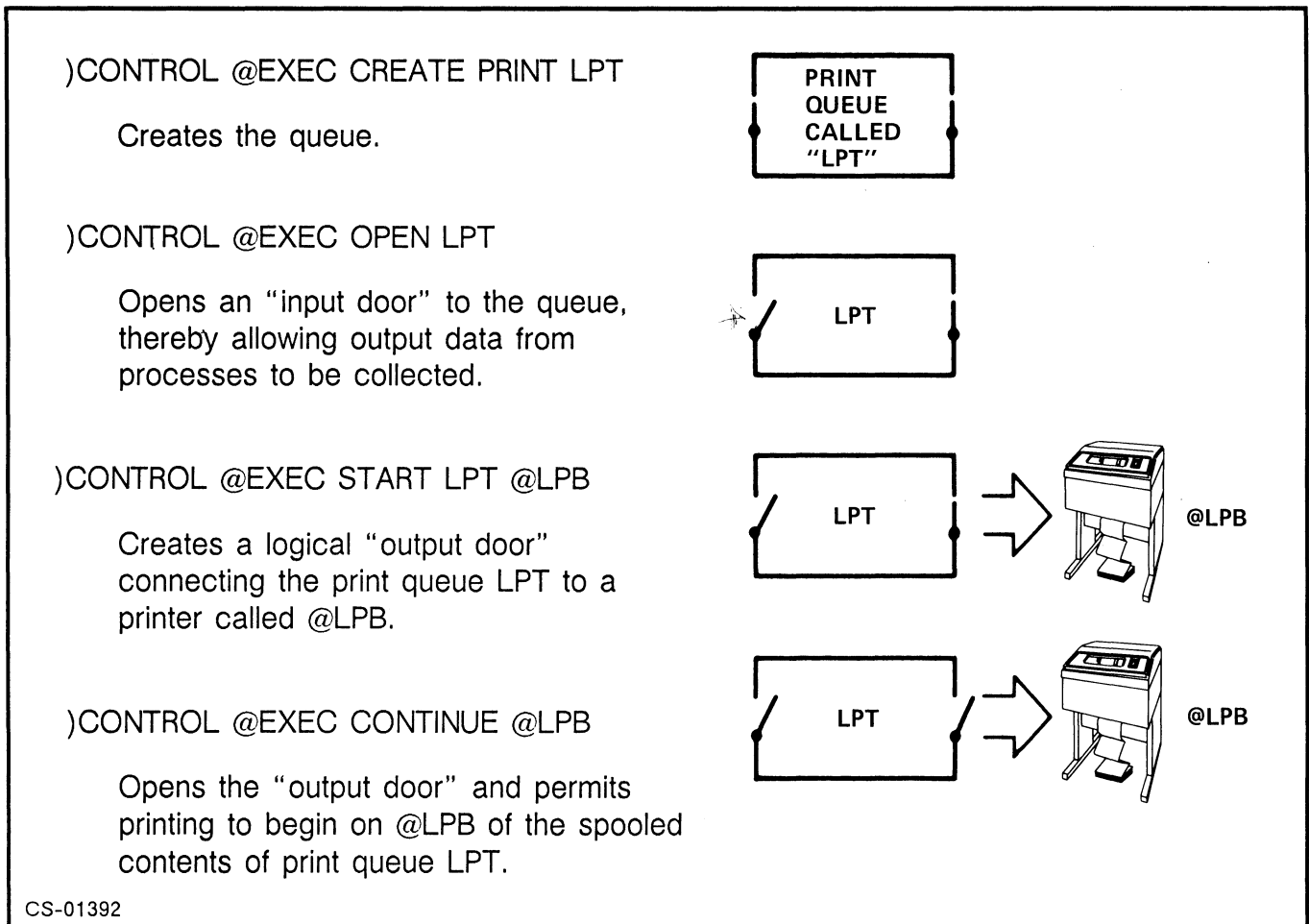


Figure 5.6

CLI “Q-Series” Commands

From CLI users can issue commands to make EXEC requests. These commands all begin with a “Q.”

QPRINT	QDISPLAY	QMODIFY
QHOLD	QUNHOLD	QCANCEL

QDISPLAY

- Displays requests waiting in the queues
- Can be done without EXEC up and running

BATCH_INPUT	BATCH	Open
BATCH_OUTPUT	PRINT	Open
BATCH_LIST	PRINT	Open
MOUNTQ	MOUNT	Open
LQP	PRINT	Closed
PUBLISHER	BATCH	Open
LDP	PRINT	Open
MFP	PRINT	Closed
LPT	PRINT	Open
70	OP	:UP.CLI
71 S	JOE	:OUTPUT:AR.PRINT.FILE
72 H	JOE	:UDD:JOE:085_000930_00
FTQ	FTA	Open

Flags explanation:

H = Held by user

S = Queued by superuser

QDISPLAY/V

BATCH_INPUT	BATCH	Open					
BATCH_OUTPUT	PRINT	Open					
BATCH_LIST	PRINT	Open					
MOUNTQ	MOUNT	Open					
LQP	PRINT	Closed					
PUBLISHER	BATCH	Open					
LDP	PRINT	Open					
MFP	PRINT	Closed					
LPT	PRINT	Open					
SEQ#	PRI	Time	Limit	FLGS	Username	Forms	Pathname
		6-OCT-88					
70	127	9:32:26	6		OP		:UP.CLI
71	200	9:36:14	89	S	JOE	INVOICE	:OUTPUT:AR.PRINT.FILE
72	127	9:36:42	89	H	JOE		:UDD:JOE:085_000930_00
FTQ	FTA						

Flags explanation:

H = Held by user

S = Queued by superuser

EXEC Queue Control Commands

Command	<i>Q NAME</i>	Description
CREATE		Creates a queue.
OPEN		Allows requests to be placed into a queue.
CLOSE		Prevents requests from being placed into a queue.
PURGE		Deletes all requests in a closed queue.
DELETE		Deletes an empty queue.
CANCEL		Cancel a request.
HOLD		Places a hold on one or more requests.
UNHOLD		Releases hold on one or more requests.
MODIFY		Alters parameters on a request in a queue.
ACCESS		Controls access to queues and streams.

CV ACCESS LPT MFCO, ORW

EXEC Spooling Cooperative Control Commands

Command	<i>DEVICE</i> Description
START	Associates a queue with a spoolable device.
PRIORITY	Sets spooling process type and/or priority. <i>PRIORITY</i>
STOP	Disassociates a queue from a spoolable device.
TERMINATE	Immediately terminates the spooling cooperative process associated with a device.
SPOOLSTATUS	List the device(s) servicing a particular queue.

) CE SPOOL @LPB

@LPB processing: BATCH_OUTPUT, BATCH_LIST, LPT

CPL = 132, LPP = 66, Headers = 1, Trailers = 1

Even pagination enabled, Binary mode disabled

Bias factor = 0, Process type = Preemptible, Priority = 127

Upper case enabled

From EXEC 13:09:10

) CE SPOOL LPT

LPT being processed by: @LPB

From EXEC 13:09:22

CX PRIORITY @LPB 3

INT CLI PRIORITY @LPB 3

PIP N

EXEC Spoolable Device Control Commands

Command	<i>DEVICE</i> Description
CONTINUE	Directs the device to proceed with processing requests.
PAUSE	Directs the device to stop processing requests at the end of the current request.
ALIGN	Stops printing at the top of the next even page, so that the operator may align the paper – resume with ALIGN/CONTINUE.
RESTART	Restarts the current request on the device.
FLUSH	Stops processing the current request and begins the next.
FORMS	Indicates to EXEC that a particular form is on the device.
LIMIT/UNLIMIT	Turns LIMITING on or off. When on, user must specify page number not greater than the maximum.
QPRIORITY	Limits the queue priority of the requests a device will process.
EVEN	Turns the even pagination feature off or on.
HEADERS/ TRAILERS	Sets the number of header and trailer pages.
CPL/LPP	Sets characters per line or lines per page.
DEFAULTFORMS	Tells EXEC that a particular form is now the default for the device.
BINARY	Enables or disables BINARY mode for special printer features.
SILENCE/ UNSILENCE	Controls announcement of requests as they start.
BRIEF/ VERBOSE	
SPOOLSTATUS	Lists the queues being processed by a device.
STATUS	Lists the state of a particular device.
ACCESS	Controls access to devices.

) CE STATUS @LPB
@LPB [Idle]
From EXEC 13:09:34

) CE STATUS
BATCH_INPUT_1 [Idle]
Bias factor = 0, Process type = Swappable, Priority = 2

BATCH_INPUT_2 [Idle] Paused
Bias factor = 0, Process type = Swappable, Priority = 2, Will pause

BATCH_INPUT_3 [Idle] Paused
Bias factor = 0, Process type = Swappable, Priority = 2, Will pause

BATCH_INPUT_4 [Idle] Paused
Bias factor = 0, Process type = Swappable, Priority = 2, Will pause

5 PRIORIT

CX SILENCE @ CON

CX BINARU @ ONIT CLEAR
SILLOW

CX ACCESS
...

Troubleshooting EXEC Printing

1. Is the printer on line and plugged in?
2. CE SPOOLSTATUS queuename
3. CE STATUS @device
4. CE SPOOLSTATUS @device
5. Check if a HOLD placed on the job
6. QD/V to see if special forms are required
7. QPRIORITY LOCKOUT
8. # pages limit exceeded for this printer

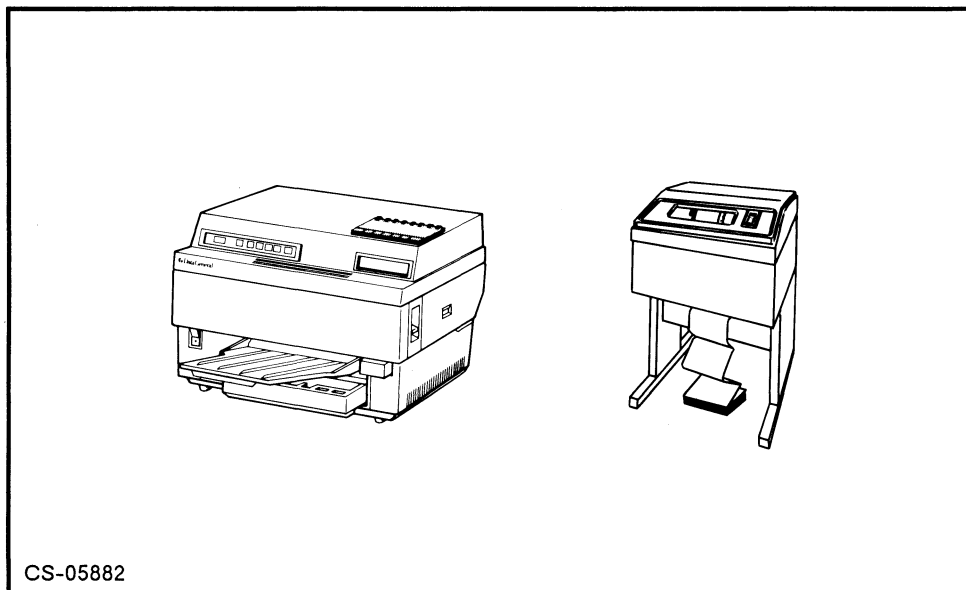


Figure 5.7

Different Spooling Configurations

Figure out how many of each EXEC command it would take to establish these configurations?

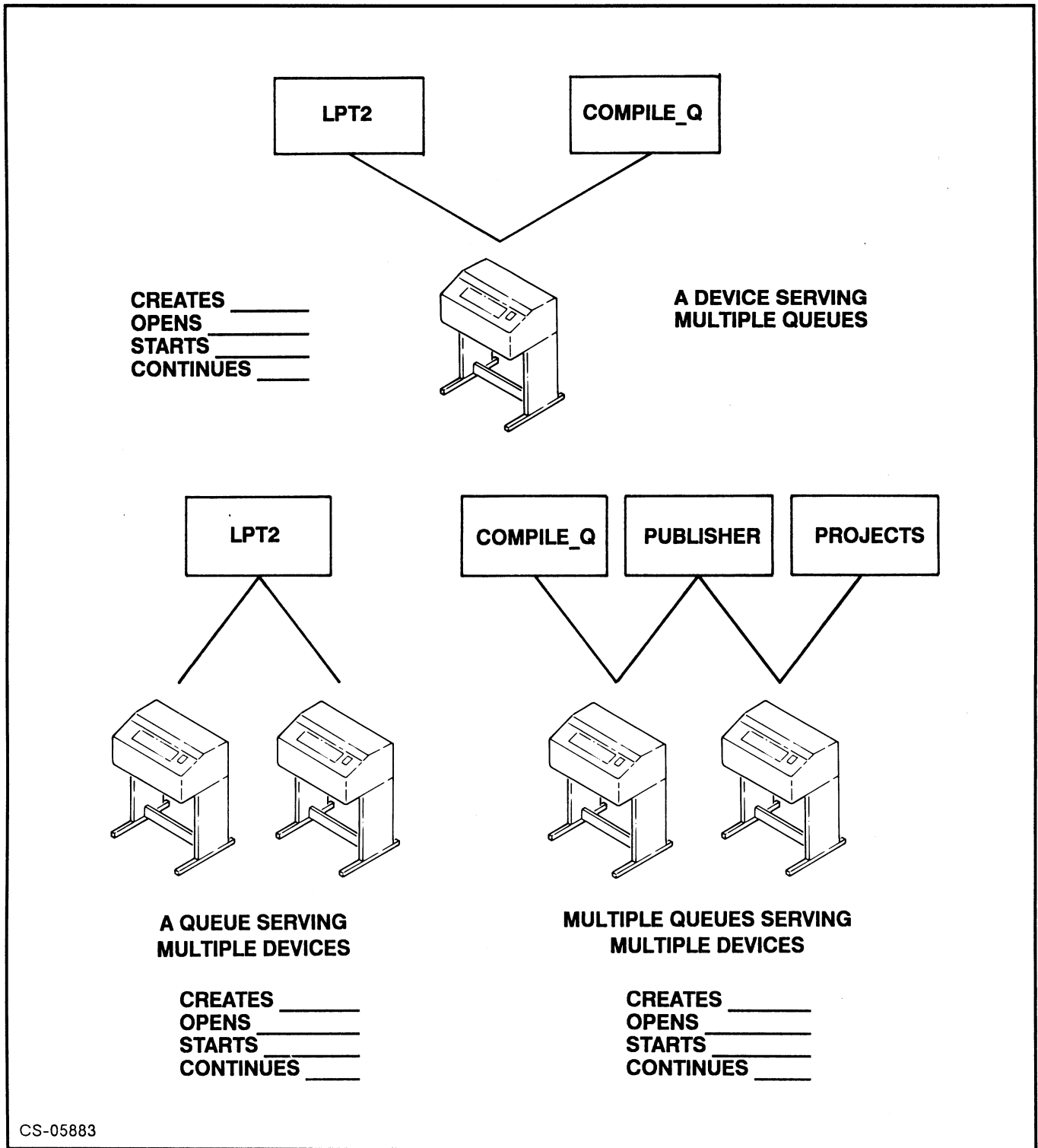


Figure 5.8

Forms Control Utility

This utility is used to associate forms control parameters with a particular formname file. These parameters include lines per page, characters per line, tab stops, and carriage control settings.

The file must first exist before you can assign characteristics to it.

FCU and Special Forms Example

Suppose you desire to generate mailing labels using a COBOL program. The label will have the format shown in Figure 5.9.

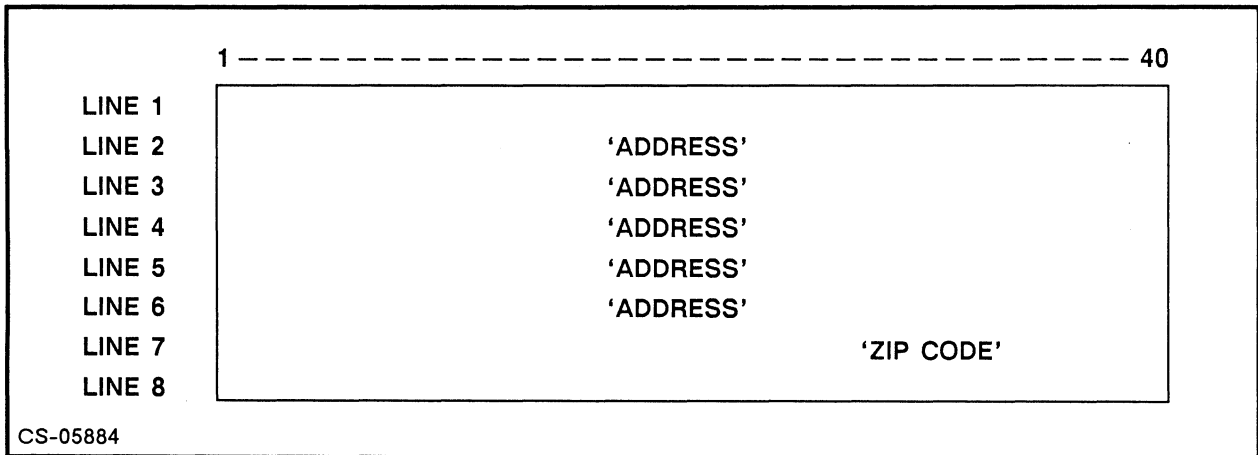
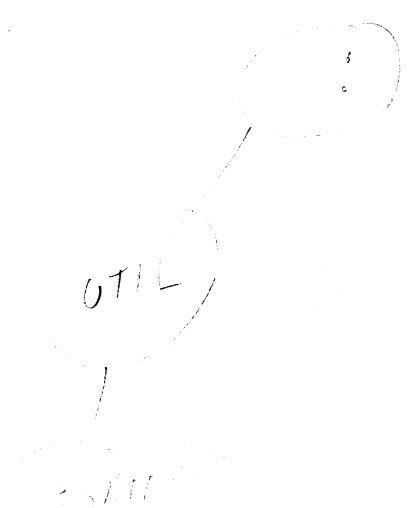


Figure 5.9 Special Forms Example



) SUPERUSER ON —
*) DIR:UTIL:FORMS
*) CREATE LABEL
*) ACL LABEL + RE
*) XEQ FCU

AOS/VS Forms Control Utility
DD-MM-YY
HH:MM:SS

Rev XXX.XXX

Type 'Help' for instructions

Command ? HELP

Legal commands:

Bye - Bye (terminate FCU)
Create - Create Forms Control Specifications for a file
Edit - Edit Forms Control Specifications for a file
Help - Help (retype this list)
List - List Forms Control Specifications to list file
Type - Type Forms Control Specifications on @CONSOLE

Abbreviations are permitted for commands.
Legal responses are shown in parentheses ().
Default/Current values are shown in brackets [].
NEW LINE selects value in brackets.

Enter VFU tape selections as 'X-Y' where:

X is line number
Y is channel number

Enter tab stop and VFU tape entries one per line followed by NEW LINE. Terminate VFU tape and tab stop entries with a single NEW LINE.

Command ? CREATE

Pathname: LABEL
Characters Per Line (16-255) [80] ? 40
Tab Stops (2-39 or STANDARD) [8,16,24,32] ? NL
Form length in Lines Per Page (6-144) [66] ? 8
Top of Form (Channel 1) Line Number (1-8) [4] ? 2
Bottom of Form (Channel 12) Line Number (2-8) [8] ? NL
VFU Tape (Line Numbers 4-8, Channels 2-11 OR STANDARD) []
? 7-2
? NL

Output to Pathname [:UTIL:FORMS:LABEL] ? NL

Command? BYE

FCU terminating

DD-MM-YY

HH:MM:SS

Sample Form Dialog

By the user:

```
)QPRINT/FORMS=LABEL LABEL_OUTPUT_FILE  
)SEND OP:OP PLEASE PUT LABELS ON THE PRINTER
```

By the operator:

```
)CONTROL @EXEC PAUSE @LPB  
)CONTROL @EXEC FORMS @LPB LABEL  
)CONTROL @EXEC CONTINUE @LPB
```

·
·
·

```
)CONTROL @EXEC PAUSE @LPB  
)CONTROL @EXEC FORMS @LPB  
)CONTROL @EXEC CONTINUE @LPB
```

← Operator physically puts
on labels, removes paper

← Operator removes labels,
replaces with regular
paper

EXEC Batch Function

The BATCH function of EXEC is designed to allow for the non-interactive execution of processes requested by users.

Background Activated Task Called Hourly

The following CLI commands are used to identify batch jobs to EXEC:

- QBATCH** Submission of 1 + CLI commands interactively or from a macro
- QSUBMIT** A user file containing commands used for repeated submissions

EXEC can process up to 10 batch jobs simultaneously, each one executing in a separate BATCH STREAM. The default batch queue, BATCH_INPUT, can only handle four.

EXEC creates three specialized queues to support batch processing:

BATCH_INPUT

BATCH_OUTPUT

BATCH_LIST

CON 23

EXAMPLES:

)QBATCH BACKUP.CLI

)QSUBMIT DEL.TEMP.FILES.CLI

Controlling the EXEC Batch Function

In order to create a logical connection between any given batch stream and the BATCH_INPUT queue, the stream must be continued.

STREAM)CONTROL @EXEC CONTINUE 3
- Activates stream #3, NOT 3 streams

BATCH_OUTPUT and BATCH_LIST must both be started at the desired output device, and that device must then be continued.

)CONTROL @EXEC START BATCH_(OUTPUT,LIST) @LPB
)CONTROL @EXEC CONTINUE @LPB

Other EXEC batch control commands:

)CONTROL @EXEC LIMIT [stream [hh:mm:ss]]
)CONTROL @EXEC PAUSE [stream]
)CONTROL @EXEC STACK pathname

*HR
1.1.1.1
DEFAULT*

*MUST USE
STREAM #*

Stacked format batch jobs:

\$\$JOB username
\$\$PASSWORD password
...
...
\$\$END

Batch Stream Layout

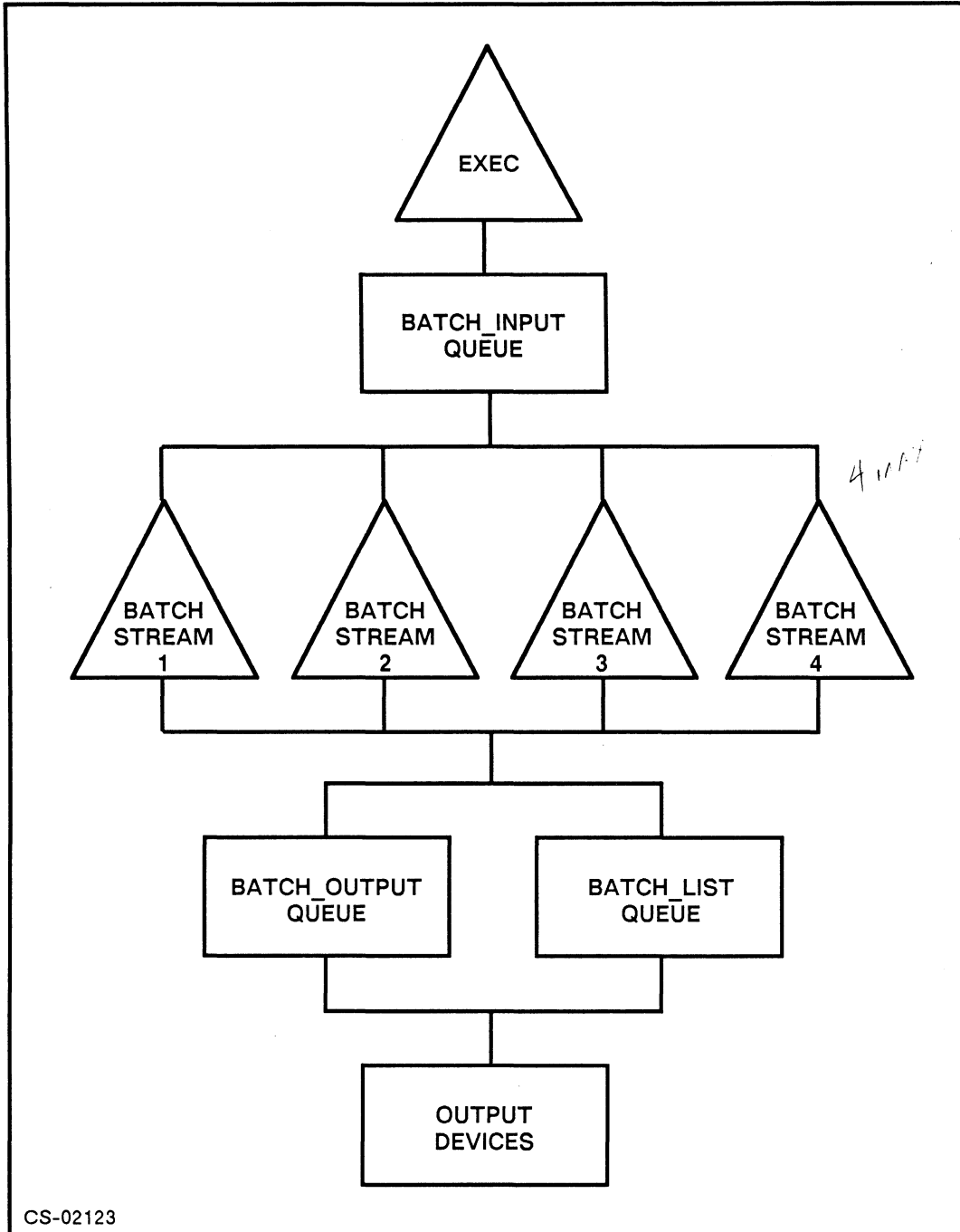


Figure 5.10 Batch Stream Layout

Default UP.CLI Macro

[!EQUAL,1,2]

[!EQUAL, ([!UNE,2, [!PID]]ERROR[!END]%/%-%),()]

SEARCHLIST :UTIL :

PUSH

SUPERUSER ON

ACL @MT- +,WARE

PROCESS/DEFAULT/DIRECTORY=@/NAME=EXEC EXEC

WAIT_FOR_PORT @EXEC

CONTROL @EXEC ENABLE/ALL

CONTROL @EXEC ((CONTINUE 1) VERBOSE)

CONTROL @EXEC START (BATCH_<OUTPUT LIST> LPT) @LPB

CONTROL @EXEC CONTINUE @LPB

CONTROL @EXEC OPEN MOUNTQ

POP

PROMPT TIME CHECKTERMS

EXECUTE CLI

[!ELSE]

WRITE *ERROR*

WRITE %0\% IS VALID WHEN INVOKED BY THE ROOT CLI

WRITE REQUIRED ARGUMENTS: NONE

WRITE OPTIONAL SWITCHES:,,NONE

[!END]

[!ELSE]

WRITE NON-EXECUTABLE SAMPLE...YOU CAN EXECUTE %0\% BY MAKING
WRITE THE ARGUMENTS IN THE COMMAND ON THE FIRST LINE EQUAL AND
WRITE MOVING THIS MACRO TO THE ROOT DIRECTORY.

[!END]

FIX UP

Default DOWN.CLI Macro

[!EQUAL,1,2]

[!EQUAL,(!UNE,002, [!PID]]ERROR[!END]%%-%), ()]

CONTROL @EXEC HALT

PAUSE 5.000

CHECKTERMS

[!ELSE]

WRITE *ERROR*

WRITE %0\% IS VALID ONLY WHEN INVOKED BY THE ROOT CLI

WRITE REQUIRED ARGUMENTS: NONE

WRITE OPTIONAL SWITCHES:,,NONE

[!END]

[!ELSE]

WRITE NON-EXECUTABLE SAMPLE...YOU CAN EXECUTE %0\% BY MAKING

WRITE THE ARGUMENTS IN THE COMMAND ON THE FIRST LINE EQUAL AND

WRITE MOVING THIS MACRO TO THE ROOT DIRECTORY.

[!END]

0 - 11P

*Q COMPRISE
3 1000000000
1 - 1*

MODULE 6

File Backup

Objectives

Upon completion of this module, the student should be able to:

1. Discuss the need for adequate file backups.
2. Use the various Data General DUMPing/LOADing facilities.
3. State the difference between full and incremental backups.
4. Use PCOPY to back up a disk.
5. Differentiate between labeled and unlabeled tapes.
6. Issue user MOUNT requests and EXEC MOUNT commands.

Reasons To Do File Backups

- Natural Disasters/Violent Weather
- Transportation Accidents
- Fire
- Water Damage
- Vandalism/Theft
- Accidental Deletion
- System Failure
- Maintenance Crews
- Unauthorized Users
- System Tune-ups
- Change in Software
- User Brain Damage

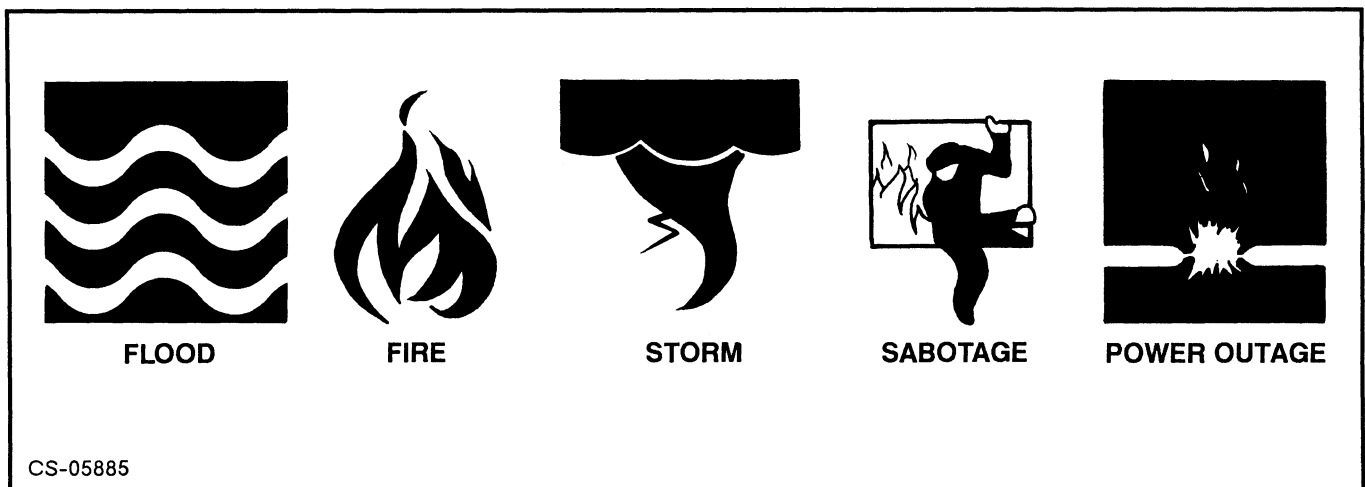


Figure 6.1

When To Back Up

- On a regular basis for all files
- On a semi-regular basis for seldom-used files
- Before and after major processing
- Before and after database reorganizations
- Before changes in AOS/VS and system software
- If hardware is failing often

File Backup Tools and Utilities

- CLI DUMP/LOAD commands
- DUMP_II/LOAD_II utility programs
- DUMP_3/LOAD_3 optional product
- DDUMP/DLOAD INFOS backup utility
- PCOPY
- MSCOPY
- Disk Mirroring
- COPY CLI command
- 3rd Party products

Verifying Backups

)COPY/V @NULL @MTB0:0

Useful Information About Magnetic Tape

Magnetic tapes will last for up to 10,000 reads if treated well. It is important to consider the following handling cautions:

- Store tapes only between 50–90 degrees F (10–40 degrees C)
- Store tapes when humidity is between 20%–90%
- Keep the outer plastic seal on the tape for protection
- Prevent magnetic fields from getting near tapes
- Don't squeeze tape by outer flanges, hold by its hub
- Always use a sticky label to list the contents
- Never touch the tape between the BOT and EOT markers
- Discard tape when soft errors continue to accumulate
- Pin down tape leader so tape won't unravel

How Much Can You Put On a Tape?

Tape Length	Density	Capacity in Mb	Capacity in Blocks
1000'	1600 bpi	16	31,000
1000'	6250 bpi	54	105,300
2400'	1600 bpi	38	74,000
2400'	6250 bpi	130	250,000

Note: All capacities are approximates.

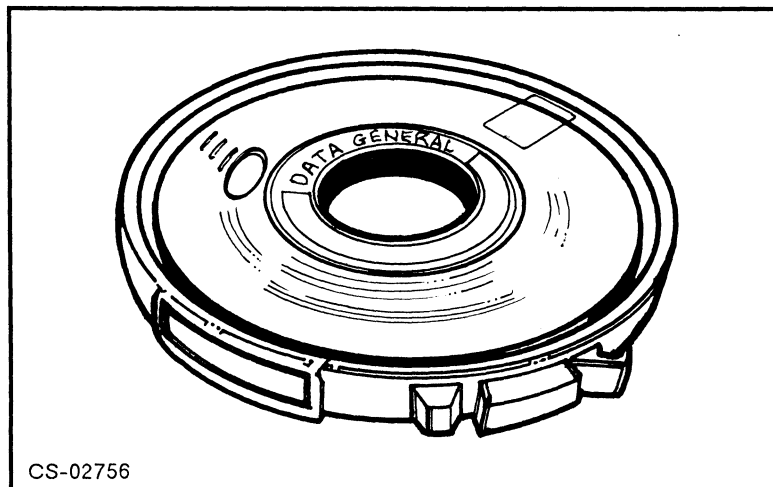


Figure 6.2

Incremental Backups

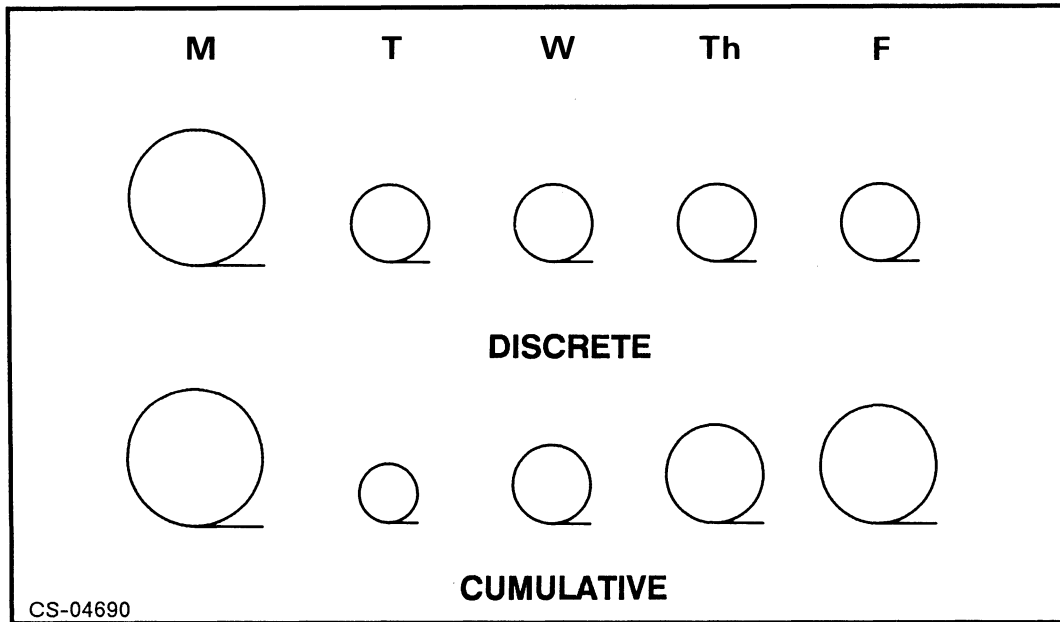


Figure 6.3

- A FULL backup requires that ALL files be dumped from root (:) down
- An INCREMENTAL backup uses the /TLM=<last backup date> switch
- Use of the /SUPTLA switch corrects the altering of the TLA file parameter, since backing up should not be treated as a file access

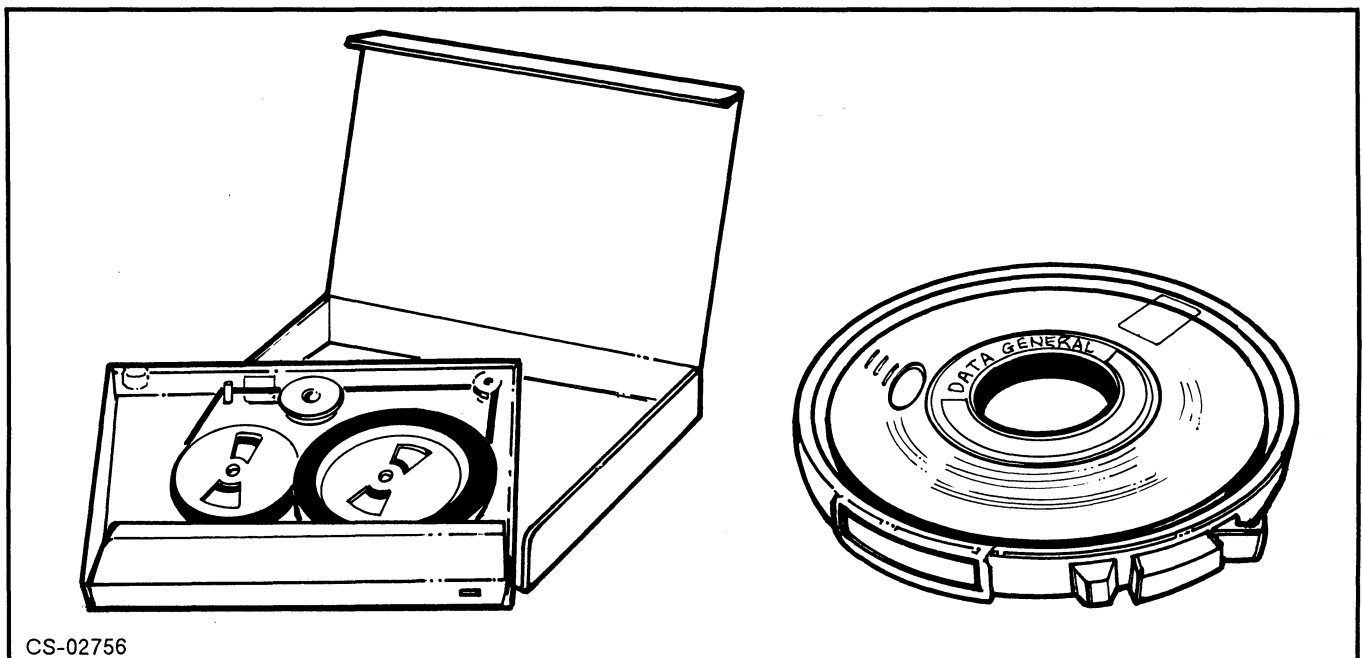


Figure 6.4

PCOPY

- PCOPY is a fast, stand-alone disk DUMP/LOAD utility.
- PCOPY lets you dump onto successive reels of LABELED TAPE, creating labels as you go, if needed, or onto disk.
- An entire logical disk must be dumped or restored. Specific directories or files cannot be selected.
- You can use PCOPY even if your logical disk has not been fixed with FIXUP.
- PCOPY will dump both sysboot and the installed system if the disk is a system disk.
- PCOPY does not dump unused disk blocks.

MSCOPY

) MSCOPY

MSCOPY Revision 7.64.00.00 on 29-Feb-1988 at 17:30:58

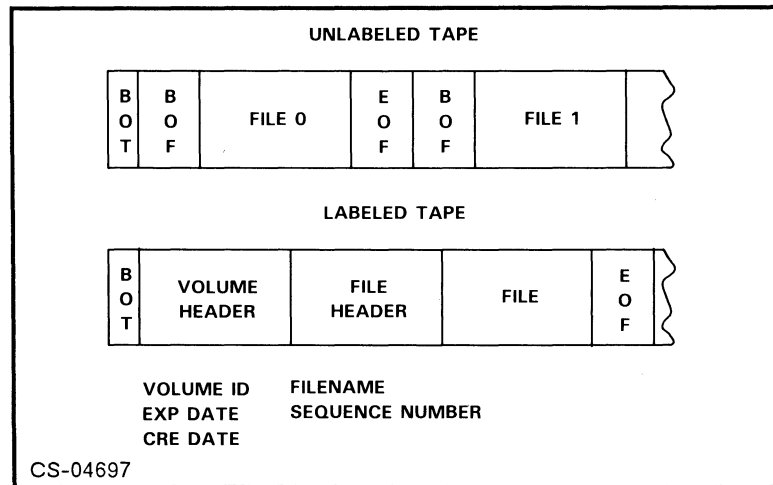
- 1 NEW - Perform a full backup, and create a new backup set.
- 2 FULL - Perform a full backup and supercede the previous backup set.
- 3 NEXT - Perform an incremental backup, and add to the current backup set.
- 4 RESTORE - Restore an LDU from a backup set.
- 5 HISTORY - Display a backup set's history.
- 6 HELP - Display help file.
- 7 BYE - Leave MSCOPY.

Please select action []

>

Note: MSCOPY works only on selected 623x models.

Tape Backup



UNLABELED TAPES

- Require information to fit on one reel unless DUMP_3 is used

LABELED TAPES

- Multiple reels, identified by up to 6-character VOLUME ID
- Require use of EXEC MOUNT facility
- Can have ANSI standard or IBM labels
- Have user labels as well as standard labels

Label Utility

- Used to assign tape labels
- Naming conventions need to be established
 -) X LABEL @device valid
 - /S Scratch the tape
 - /I Create IBM labels
 - /UVL= User volume label
 - /OWNER= Specify owner

To see a label, issue this command:) TYPE @device with tape on drive.

User Mount Requests

- Explicit MOUNT requests:

```
)MOUNT linkname message
)MOUNT/VOLID=XXXXXX linkname message
)MOUNT/NOPEND linkname message
```

- Implicit MOUNT request:

```
)DUMP_II/V/BUF=32768 @LMT:volid:filename
```

User Console	OP Console
<pre>)MOUNT/VOLID=SAL01 MYTAPE Please mount a scratch tape -- ring in UNLABELED MOUNT REQUEST</pre>	<pre>From Pid 3: (EXEC):**UNIT MOUNT ** From Pid 3: MID=534 USER=ARCHIE PID=41 From Pid 3: VOLID(S) ARE: SAL01 From Pid 3: Request is 'Please mount a scratch tape -- ring in' From Pid 3: Respond: CONTROL @EXEC MOUNTED @<unitname> From Pid 3: Or: CONTROL @EXEC REFUSED)CONTROL @EXEC MOUNTED @MTD0</pre>
<pre>)MOUNT/VOLID=VOL1 MYTAPE Please use large tapes LABELED MOUNT REQUEST</pre>	<pre>From Pid 3: (EXEC) **Explicit Labeled Mount ** From Pid 3: MID=1454, User=JR, PID=27, EXEC Sub-tree PID=27 From Pid 3: Request is 'Please use large tapes -- high density' From Pid 3: No units mounted From Pid 3: Current volume: VOL1, ALL volumes: VOL1 From Pid 3: Respond: CONTROL @EXEC MOUNTED @<unitname> From Pid 3: Or: CONTROL @EXEC REFUSED)CONTROL @EXEC MOUNTED @MTD0</pre>
<pre>)DISMOUNT MYTAPE Thanks</pre>	<pre>From Pid 3: (EXEC) ** Waiting to be Dismounted ** From Pid 3: MID=1454, User=JR, PID=27, EXEC Sub-tree PID=27 From Pid 3: Unit(s) are: @MTD0)CONTROL @EXEC MOUNTED @MTD0</pre>

Other EXEC MOUNT commands:

```
PREMOUNT
REFUSED
ALLOCATE
OPERATOR
```

```
MOUNTSTATUS
UNITSTATUS
RELEASE
```


MODULE 7

Processes

Objectives

Upon completion of this module, the student should be able to:

1. Identify the attributes of a process.
2. Define virtual memory, working set, page fault, and demand paging.
3. State the difference between logical shared and unshared memory.
4. State the difference between logical and physical page faults.
5. List the process types and priority groups.
6. List the default range of assignable priorities for each group.
7. Show the relationship between assigned priorities and PNQF for each group.
8. Define time slice and subslice.
9. Describe how AOS/VS updates the behavior rating.
10. Create and manage processes, assigning the appropriate attributes.
11. Manage a large PID environment.
12. Properly initialize and release logical job processors.

Processes

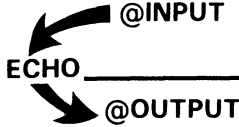
A process is a set of attributes within which a program is running. Up to 1024 processes may compete for physical memory and CPU time.

Process Attributes

- PID
- Username *NO USE*
- Process name
- Program
- Initial directory
- Current directory
- Searchlist
- Default ACL
- Logical address space type *16 OR 32 BIT*
- Generic filenames *@ LIST.GNF WRITE
@ OUTPUT.GNF
@ ~~input~~.GNF
@ DATA.GNF
PORT #*
- Working set limits *@ CONSOLE*
- Process type
- Process priority *7-7*
- Privileges
- *PID TYPE*
*A SMALL PID
B HYBRED
C ANY PID*
- *CLASS ID*

Generic Files

- Found in :PER with a type of GFN.
- Actual files associated with EACH process at creation time.

	LOG ON AT CONSOLE	BATCH JOB COMMENCES	CLI XEQ COMMAND
 @INPUT	@CONn	batch job command file	Same as CLIs @INPUT
@OUTPUT	@CONn	:QUEUE:user.OUTPUT.n	Same as CLIs @OUTPUT
@CONSOLE MUST BE TYPE "CON"	@CONn	_____	Same as CLIs @CONSOLE
@DATA	_____	_____	CLIs DATAFILE
@LIST	_____	:QUEUE:user.LIST.n	CLIs LISTFILE

CS-04339

Figure 7.1 Example of Generic File Assignments

Note: @NULL is used for testing, and is not associated with any process.

IPC INTER PROCESS CONTROL

Virtual Memory

VIRTUAL MEMORY enables you to run programs larger than the physical memory size of the machine.

- Maximum logical address space = 4 Gigabytes

Not all of the logical address space of a process needs to be represented in PHYSICAL memory all the time that it is executing.

- Logical page = 2 Kbytes

Working Set

The list of LOGICAL pages of a process, which are currently represented in PHYSICAL memory.

Initial Working Set

- Logical page zero
- Start page

Page Fault

Occurs when a process references a LOGICAL address not currently in its WORKING SET.

Demand Paging

System adds required LOGICAL page to WORKING SET of a process.

Unshared Versus Shared Memory

- Unshared (data)
- Shared (instructions):
 - Write-protected

Logical Versus Physical Page Faults

PHYSICAL (REQUIRES DISK I/O):

- Unshared page faults are physical if data not already in memory.
- Shared page faults are physical if data not already in memory.

LOGICAL (NO DISK I/O REQUIRED):

- Shared page faults are logical when data already in memory.

Working Set Limits

- Minimum working set size.
- Maximum working set size.

Memory Contention

- Definition -
- Light contention -
- Heavy contention -

INSTALL BOOK

SWAP and PAGE Directories

- Disk-based extensions of memory
- Variable SWAP files
- Deleting PAGE and SWAP

Process Types

- Resident -
 - Preemptible -
 - Swappable -
- } SWAPABLE WITH DIFF.

Process States

- Eligible - READY TO PROCESS & PROCESS IN MEMORY
- Ineligible - READY TO PROCESS WAITING FOR MEMORY AVAILABILITY
- Blocked - 1) WAITING FOR I/O 2) FATHER PROCESS WITH ACTIVE SON
3) PLACED THERE BY CLI BLOCK COMMAND

AOS/VS Page Search Algorithm

- | | | |
|-----------|---|--|
| STATE 1 | [| Free Memory |
| |] | LRU Cache |
| STATE 2/3 | [| Explicitly blocked preemptible/swappable processes |
| |] | Blocked processes for console I/O |
| |] | Page stealing |
| STATE 4 | | Swapping ready processes |

Process Scheduling

- Processes are scheduled according to PROCESS GROUP.
- Process group determined by ASSIGNED PRIORITY.
- All processes can have assigned priorities from 1 to 511.
- GROUP BOUNDARIES set at VSGEN time.

Default Group Boundaries

GROUP 1	GROUP 2	GROUP 3
1 – 255	256,257,258	259 – 511

Swappable processes with assigned priority 1, 2, or 3 actually get assigned priorities 256, 257, or 258, respectively.

Priority Enqueue Factors (PNQF)

- **Group 1** – PNQF = assigned priority.
- **Group 2** – PNQF calculated heuristically using assigned priority and behavior rating; Group 2 PNQFs always larger than Group 1 PNQFs.
- **Group 3** – Based on assigned priority, but always larger than largest possible Group 2 PNQF.

Heuristic Scheduling for Group 2

- Considers behavior of process.
- INTERACTIVE processes get HIGHER PRIORITY (smaller PNQF).
- COMPUTE-BOUND processes get LOWER PRIORITY (larger PNQF).

Time Slices and Behavior Rating

A time slice is not an assigned amount of CPU time, but a PREDICTION of the amount of CPU time the process is expected to use WITHOUT BLOCKING itself.

Updating Behavior Ratings

If a process blocks itself before using all of its time slice,

$$\text{NEW BEHAVIOR RATING} = \text{OLD BEHAVIOR RATING} - 1$$

If a process uses all of its time slice,

$$\text{NEW BEHAVIOR RATING} = \text{OLD BEHAVIOR RATING} + 1$$

Time Slice Formula

$$\text{Time Slice} = .032 \text{ sec} \times 2^{\text{Behavior Rating}}$$

As the behavior rating increases, the amount of CPU increases

Every 32 mS AOS/VS interrupts the CPU to see if there is another process that should be scheduled. A time slice is NOT a contiguous entity.

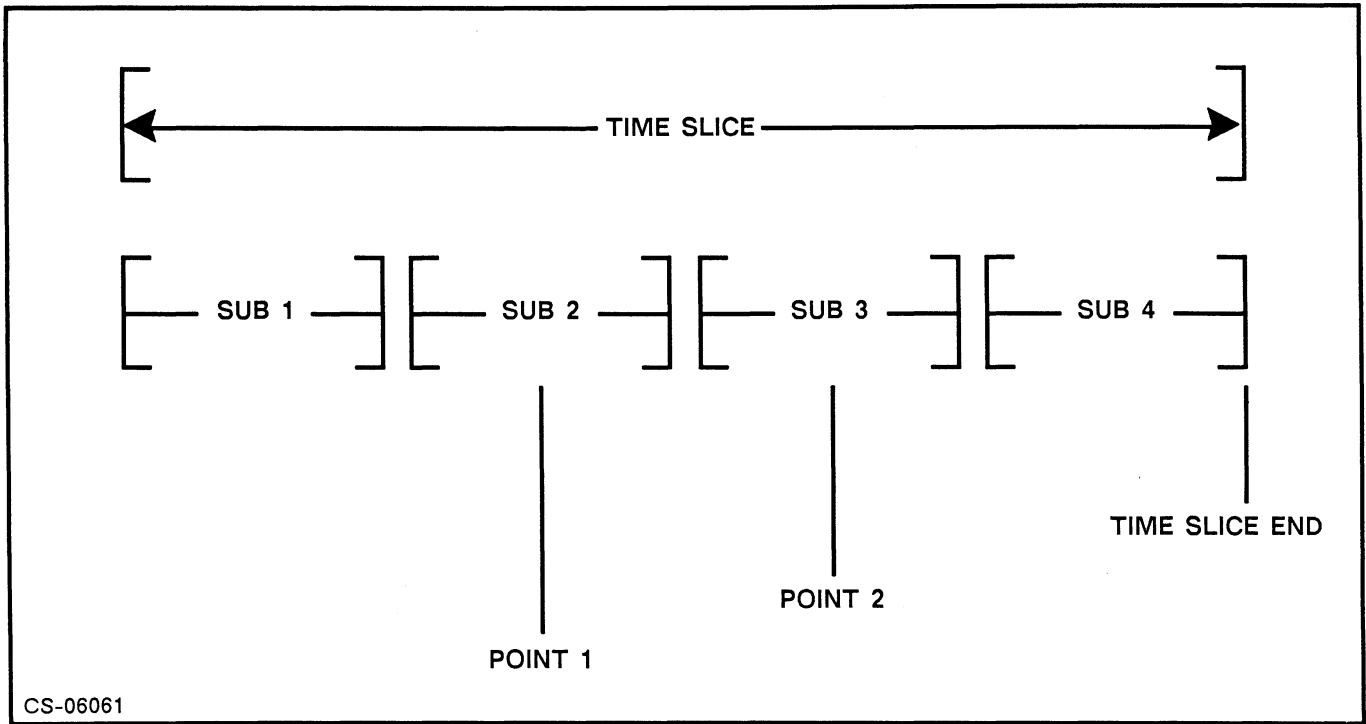


Figure 7.2

Time Slice Table

Behavior Rating	Time Slice
1	64ms
2	128ms
3	256ms
4	512ms
5	1.024 sec
6	2.048 sec

GROUP	PRIORITY	PNQF IN DECIMAL	PNQF IN OCTAL
1	1-255	1-255	1-377
2	256	264-269	410-415
2	257	271-276	417-424
2	258	278-283	426-433
3	259-511	287-539	437-1033

CS-05886

Figure 7.3 Priority - PNQF Relationships

Scheduling Rule

- The highest priority ELIGIBLE process will run next.

PNQF Formulas

Group 1 PNQF = Priority

Group 2 $PNQF = G1+1+(7*(Asg Pr -G1))+B.R.$

Group 3 $PNQF = 7*(G2-G1+1)+Asg Pr$

G1,G2 - Group Boundaries

Asg Pr - Assigned Priority

B.R. - Behavior Rating

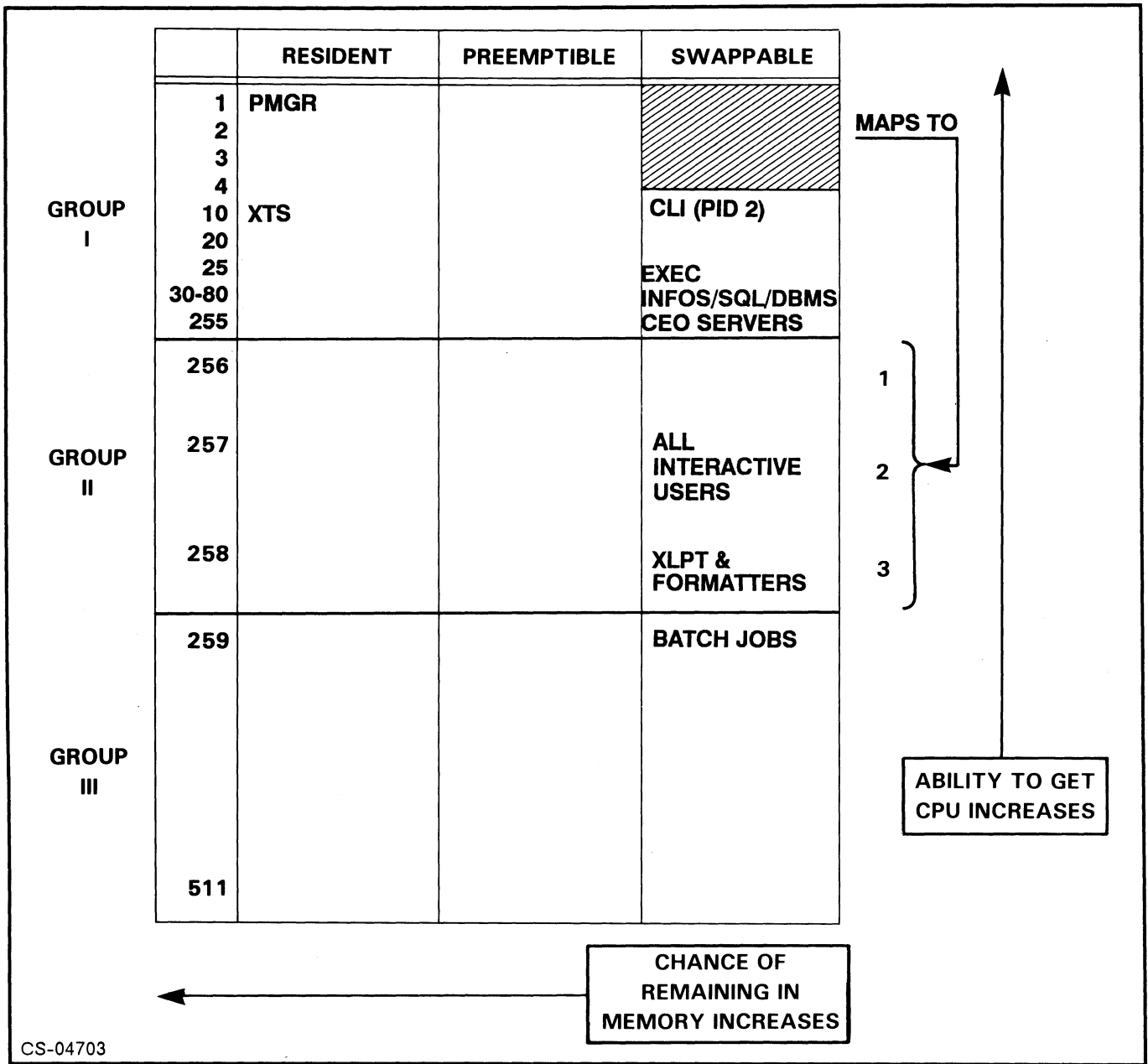


Figure 7.4 A Sample Priority Matrix

CAUTION: A priority set too high may inhibit throughput.

Process Creation

The CLI can create a subordinate process with XEQ or the PROCESS command.

The XEQ command assumes many defaults for the attributes of the new process, while the PROCESS command has switches to set the attributes.

) XEQ, program [, arg...]

is the same as

) PROC/BLOCK/DEF/SONS/IOC/DATA=[!DATA]/LIST=[!LIST], program&
[, arg...]

Process Information and Control Commands

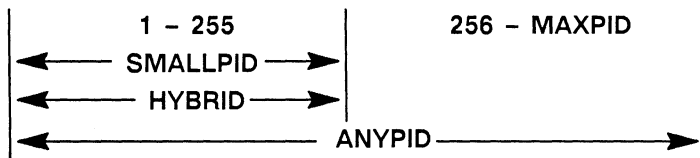
- WHO
- TREE
- RUNTIME
- PRIORITY
- PRTYPE
- BLOCK
- UNBLOCK
- TERMINATE
- CHECKTERMS

Running with More Than 255 PIDs

- Big PIDs are an optional resource.
- MAXPID is set at VSGEN time.
- SMALLPIDS.
- HYBRIDS.
- ANYPIDS.

? EXEC
 ? I REC
 ? P STAT

)X SPRED =.PR
)PID_CALL.CHECK =.PR



Program and Process PID-Size Types

PRV TYPE	PROCESS TYPE
SMALLPID	A
HYBRID	B
ANYPID	B or C

Big PID Process Types

A-Type

- SmallPID-type program
- PID between 1 and 255
- PID-size type of processes before Rev 7
- Cannot communicate with Hybrid or Anypid

B-Type

- Hybrid program
- PID between 1 and 255
- Most DG products, including CLI and EXEC, run as B-type processes
- Can create and communicate with any PID-type program

C-Type

- AnyPID if PID above 255 is free
- Hybrid if no PID above 255 is free
- Can execute any PID-size type program, but cannot communicate with smallPID program

Multiple Processors

Mother/Daughter

Defined by hardware switches.

Mother

- Default CPU
- Booted

Daughter

- Initialized
- Released
- JPINITIALIZE
- JPRELEASE

Each processor schedules itself, based on process priorities and classes.

MODULE 8

Planning for a Multi-User Environment

Objectives

Upon completion of this case study, the student should be able to:

1. Plan for an efficient directory structure.
2. Develop a simple but secure username scheme.
3. Recognize the application of macros for operational use.
4. Recognize the various aspects of good documentation.
5. Determine where to place files on initial disk loading.
6. Determine the need for disaster and security plans.
7. Cite some of the political roles a system manager has to play.

PENGUIN CORPORATION is a California start-up that specializes in mail-order novelties, like pink flamingos for the lawn, the Ginsu knife, and record albums by less than talented artists.

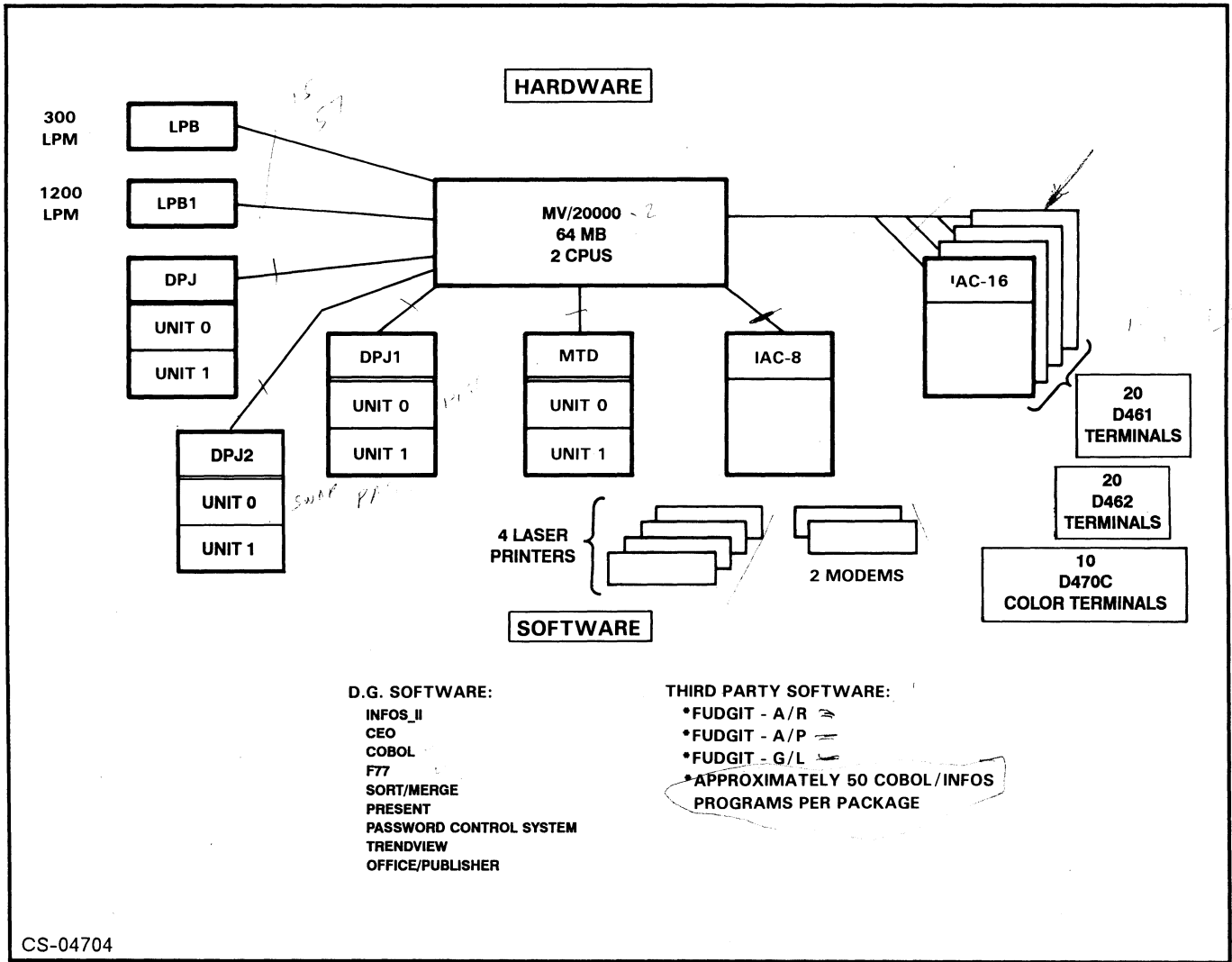


Figure 8.1

2 192 CACHE

Basic AOS/VS Directory Structure

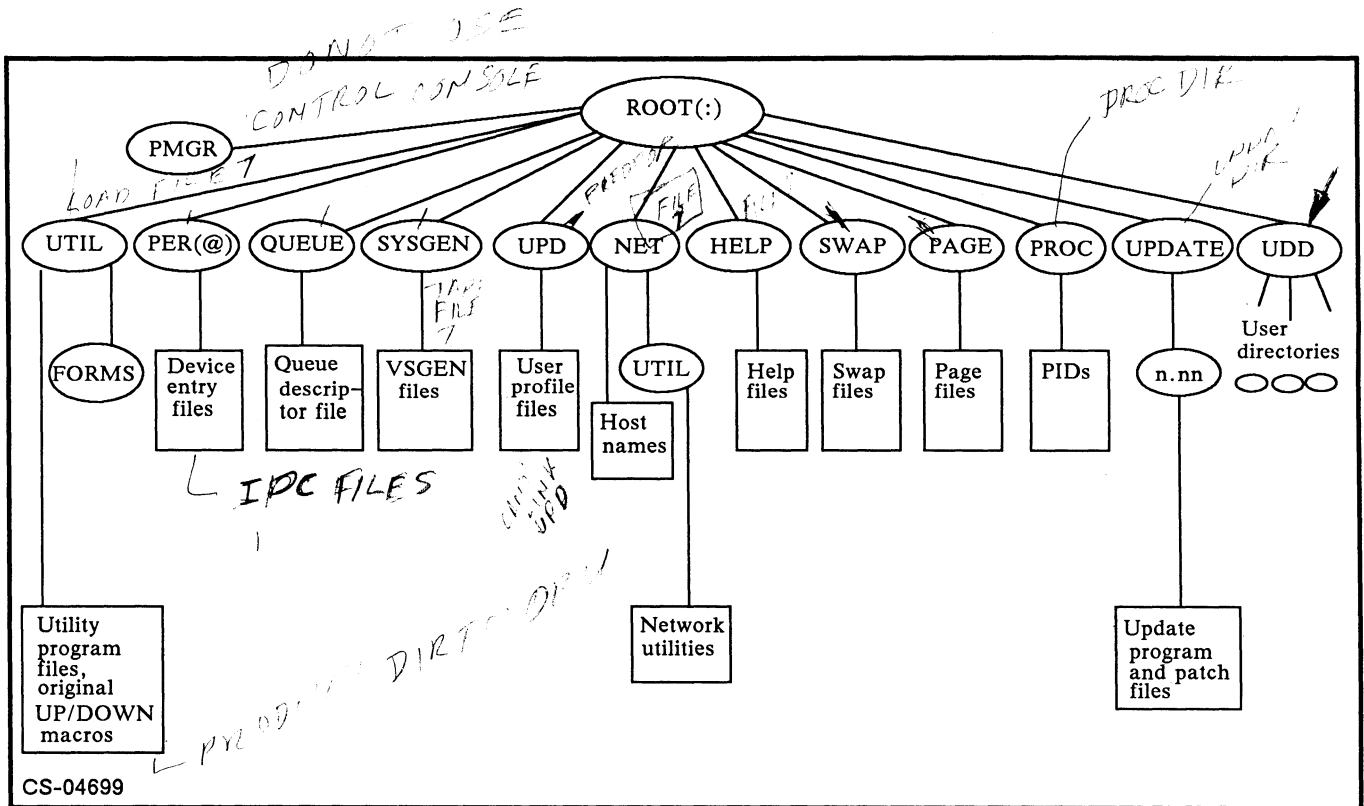


Figure 8.2 Basic AOS/VS Directory Structure

Typical Directory Structure with Data General Utilities Loaded

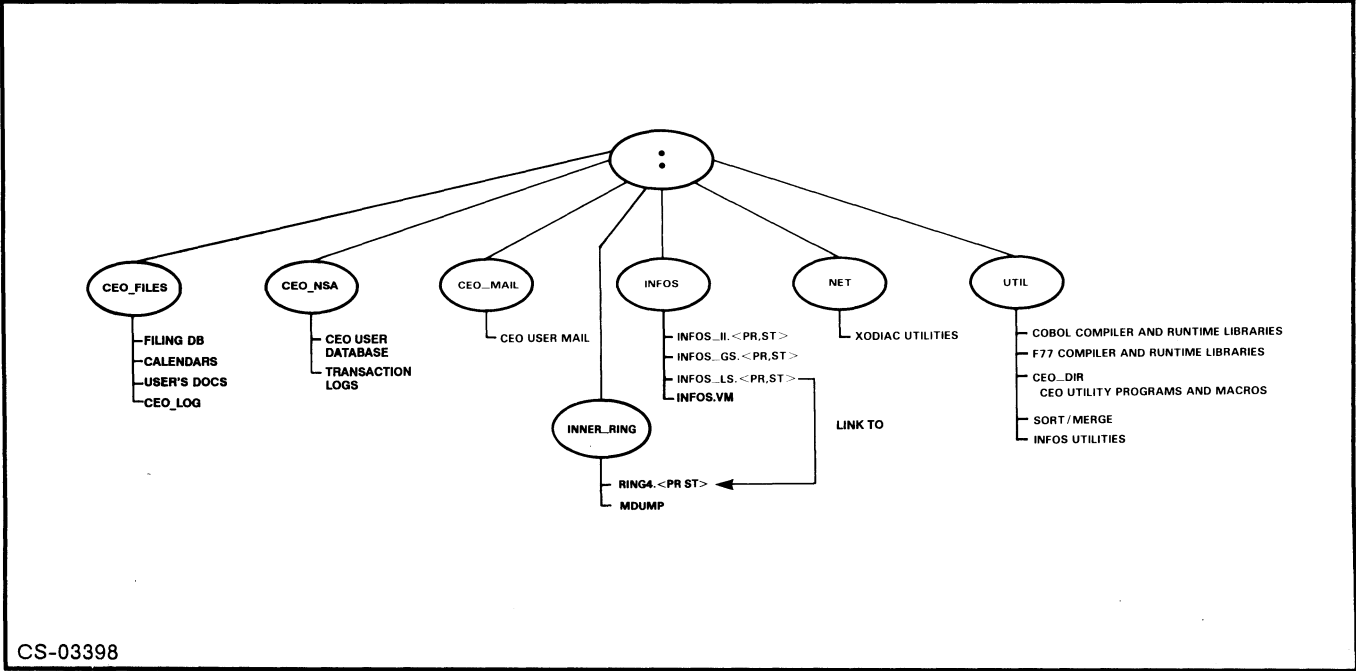


Figure 8.3 Typical Directory Structure with Data General Utilities Loaded

Penguin Corp Directory Layout for Business and R&D Software

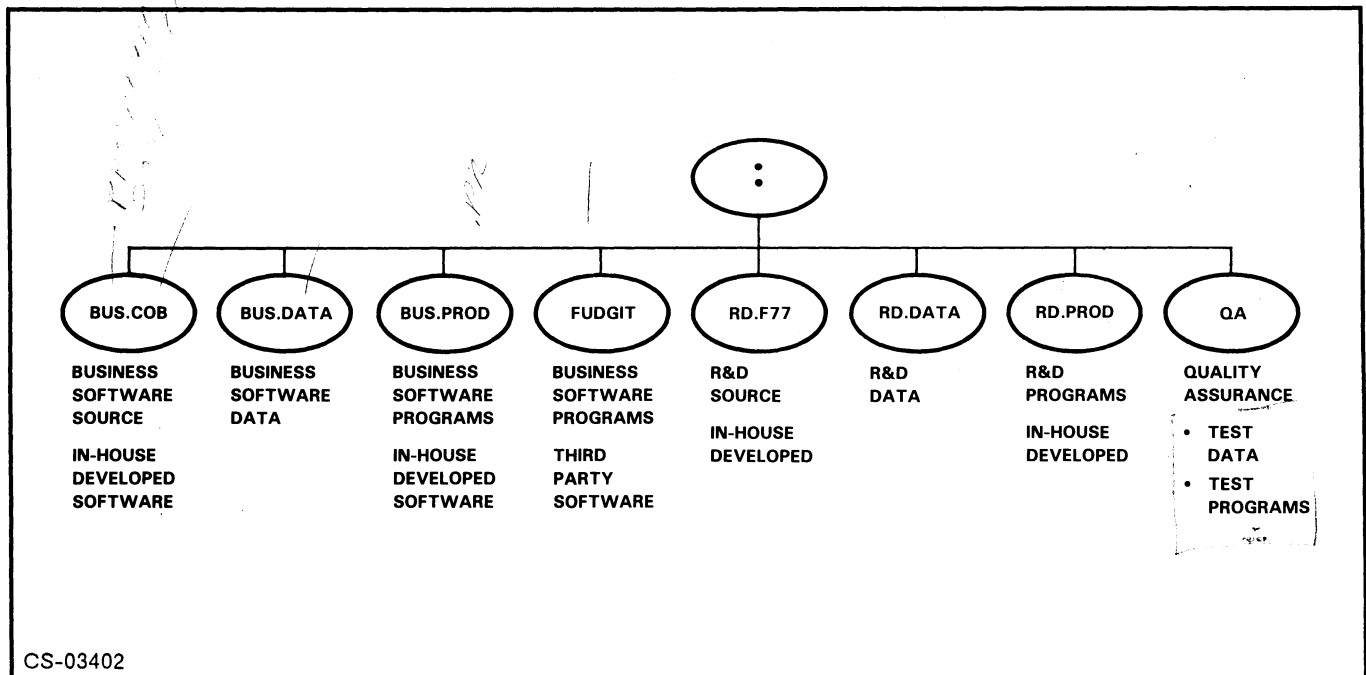
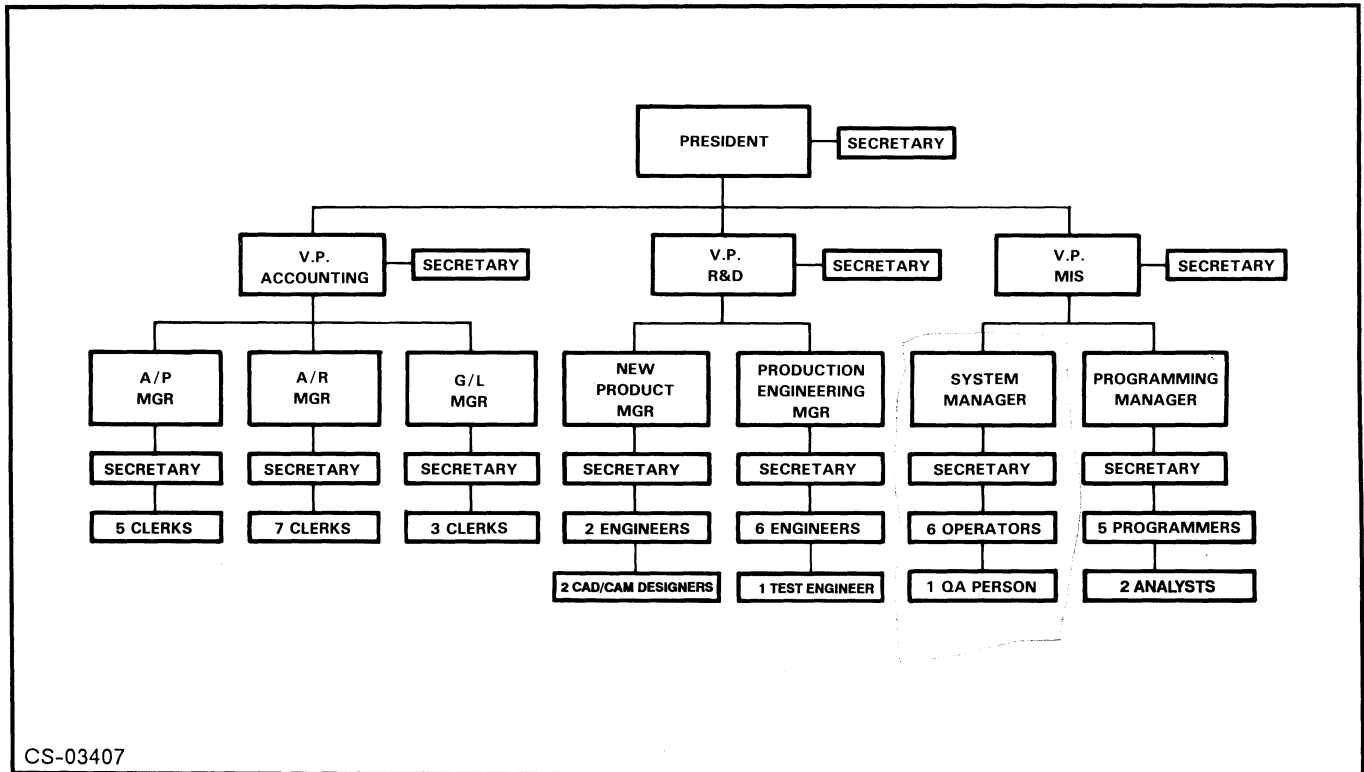


Figure 8.4 Penguin Corp. Directory Layout for Business and R&D Software

Which is better, a deep or a flat directory structure?

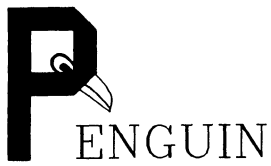
Penguin Corp System Users Org. Chart



CS-03407

Figure 8.5

As the system manager at PENGUIN, you are asked to distribute the 50 terminals. List by department or area who would get them, and be prepared to discuss with the class.



MT +
DE +

ACCESS

Penguin Username Scheme

USER CLASS	+	USER NAME	
(PRESIDENT & ALL VP'S & MANAGERS)			"HIGH-CLASSED USERS"
↳ \$PRES		JOHN	= \$PRES.JOHN.3000 <i>SECRET #</i>
\$VPAC			-
\$VPRD			-
\$VPMS			-
\$APMR			-
\$ARMR			-
\$GLMR			-
\$NPMR			-
\$PEMR			-
\$SYSM			-
\$PRMR			-
USER CLASS		USER NAME	"LOW-CLASSED USERS"
SECRET	+	JILL	= SECRE.JILL
↑ ALL SECRETARIES			
↓ SECRET		PHILIP	= SECRE.PHILIP
APCLK		TOM	= APCLK.TOM
ARCLK			
GLCLK			
NPENG			
PEENG			
OPER			
QA			
PGMR			

Possible Elements of a Username Scheme

- Name
- Department MF DF
- Location
- Facility
- ID number
- Random characters
- Cost center
- Job number
- Title/Function
- Project
- Hostname
- Phone extension

PENGUIN instituted an automated system to assign projects to their programmers, and then have the programmers turn them over to QA. They use macros to accomplish this. The actual macro listings can be found in :S219VS:MACROS.

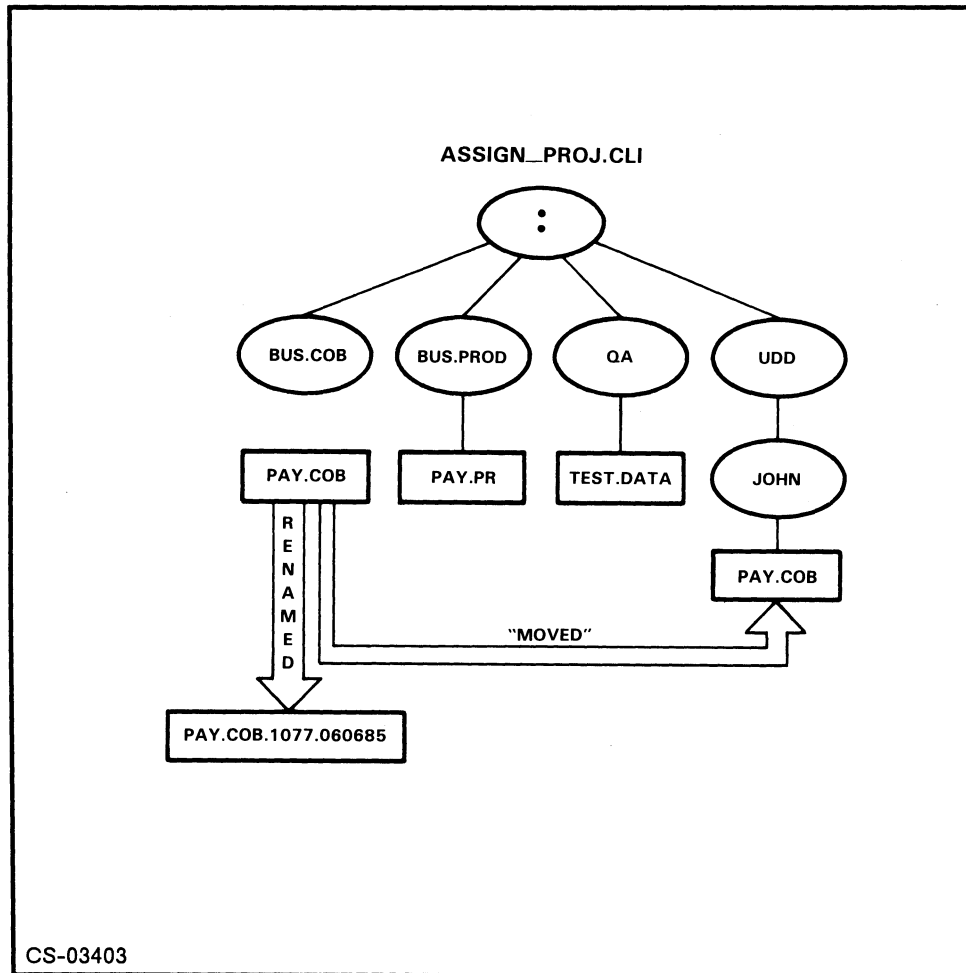


Figure 8.6 ASSIGN_PROJ.CLI

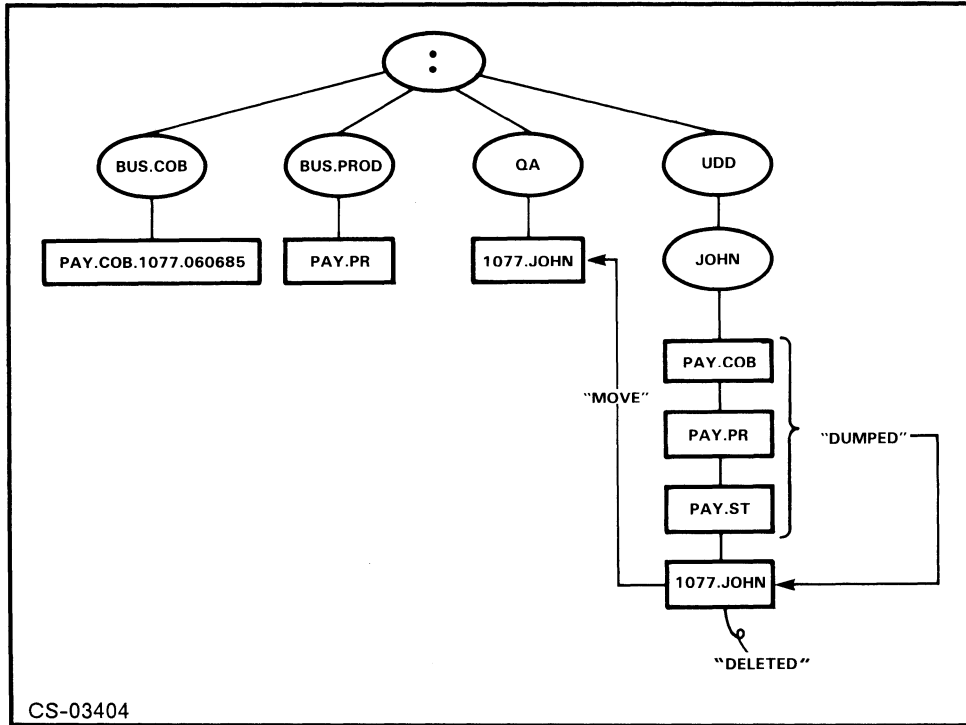


Figure 8.7 Q.A.CLI

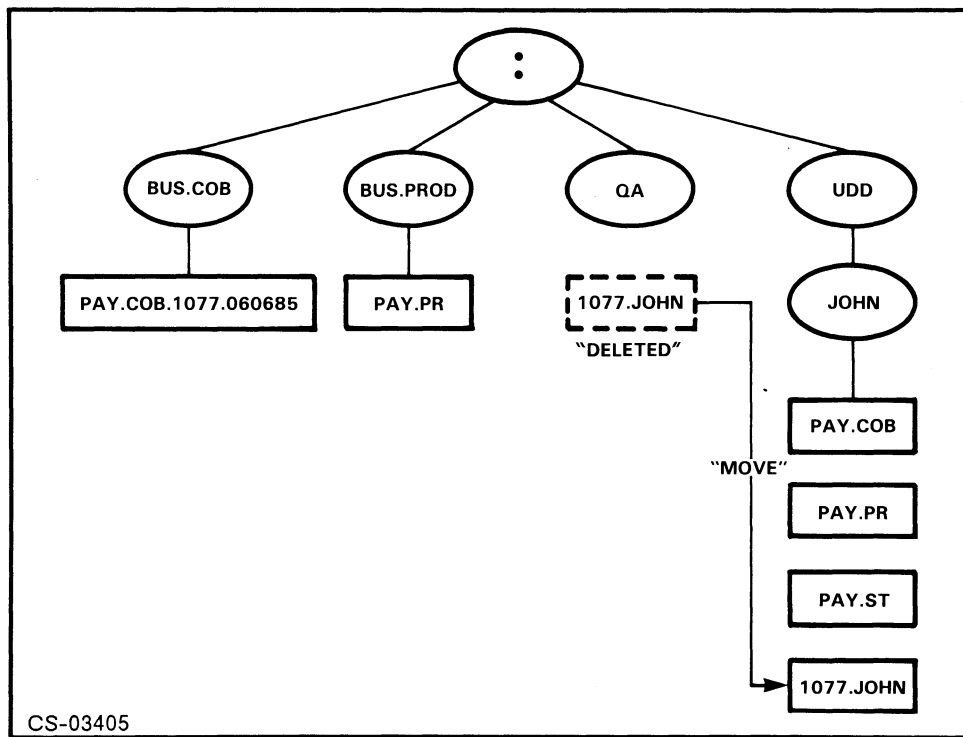
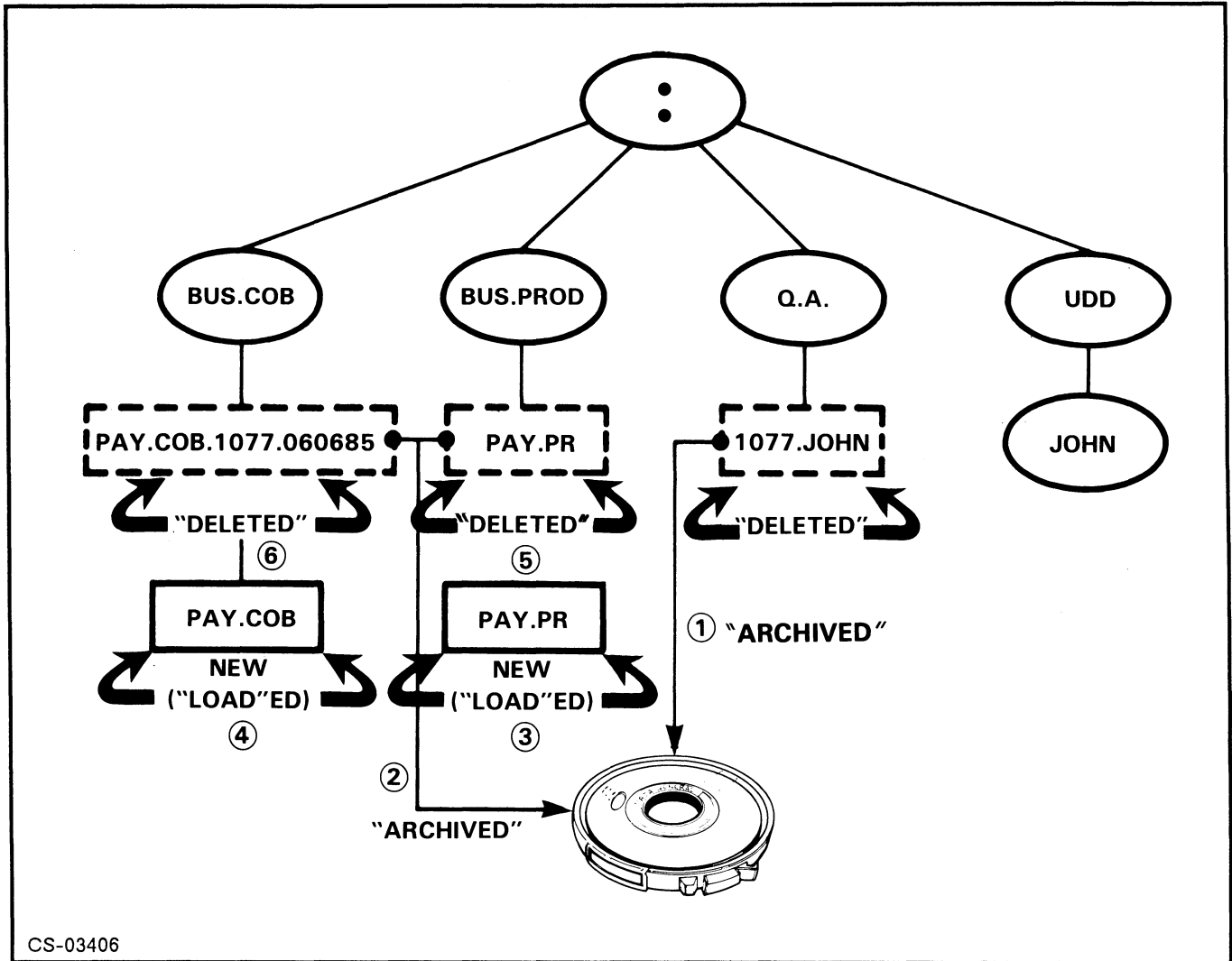


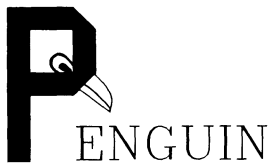
Figure 8.8 REJECT.CLI



CS-03406

Figure 8.9 INSTALL.CLI

Why keep both the old and new revisions of the source and program?



Documentation

PENGUIN is a strong believer in system documentation. The analysts and programmers are responsible, as well as lead operators, in maintaining the current level.

The different types of documentation PENGUIN believes important:

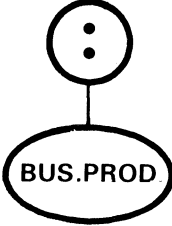
- Directory and file ACL listings *YES*
- Program source code listings *YES*
- File/program cross reference list *YES*
- Process group layout matrix
- Queue-device relationship forms
- Batch stream layout forms
- Backup analysis forms
- Printer locations
- Daily and weekly operational procedures
- Up/down macro listings
- Hardware configuration and inventory
- Device codes
- IAC Maps *YES*
- Key DG personnel
- Current hardcopy of VSGEN spec file *YES*
- Vendor lists *?*
- Tape management *YES*
- Data General system manuals *NO*
- Software revision levels list *NO*
- System interaction flow charts *NO*
- Terminal wiring diagrams for building *NO*
- Terminal DIP switch or firmware settings *NO*
- AOS/VS panic file AOSVS.PANICS.SR

DIRECTORY ACL PLANNING SHEET

DIRECTORY : BUS.PROD
 PARENT DIRECTORY: ROOT
 LDU LOCATION :

USER CLASS(ES)
 ALLOWED ACCESS:

LOCATION DRAWING



CLASS	ACCESS	FILES STORED IN THIS DIRECTORY
	E R A W O	
QA.	X X X X	LIST HERE BRIEF DESCRIPTION OF FILES STORED
+ (ALL ELSE)	X	ATTACH "FILESTATUS" LISTING OF FILES

CS-03410

Figure 8.10

DIRECTORY PERMISSIONS MONTHLY

To produce a monthly listing of all files and their ACL's:

```
)SUPERUSER ON
*)DIR :
*)ACL/V/L=listfilename #
```

To produce a master list of the entire directory structure:

```
)SUPERUSER ON
*)DIR :
*)F/AS/HASH/TYP=10-12/L=listfilename #
```

(/TYP=10-12 is the same as /TYP=DIR/TYP=CPD/TYP=LDU)

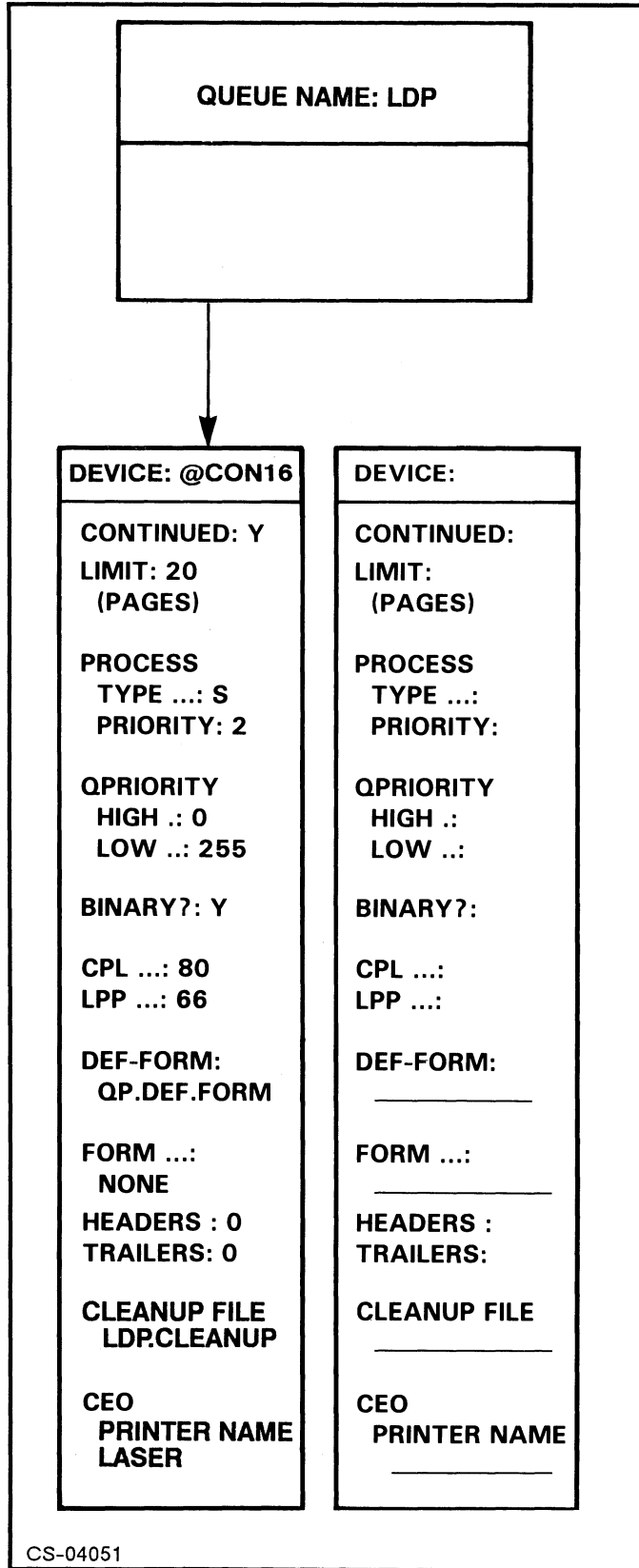


Figure 8.11

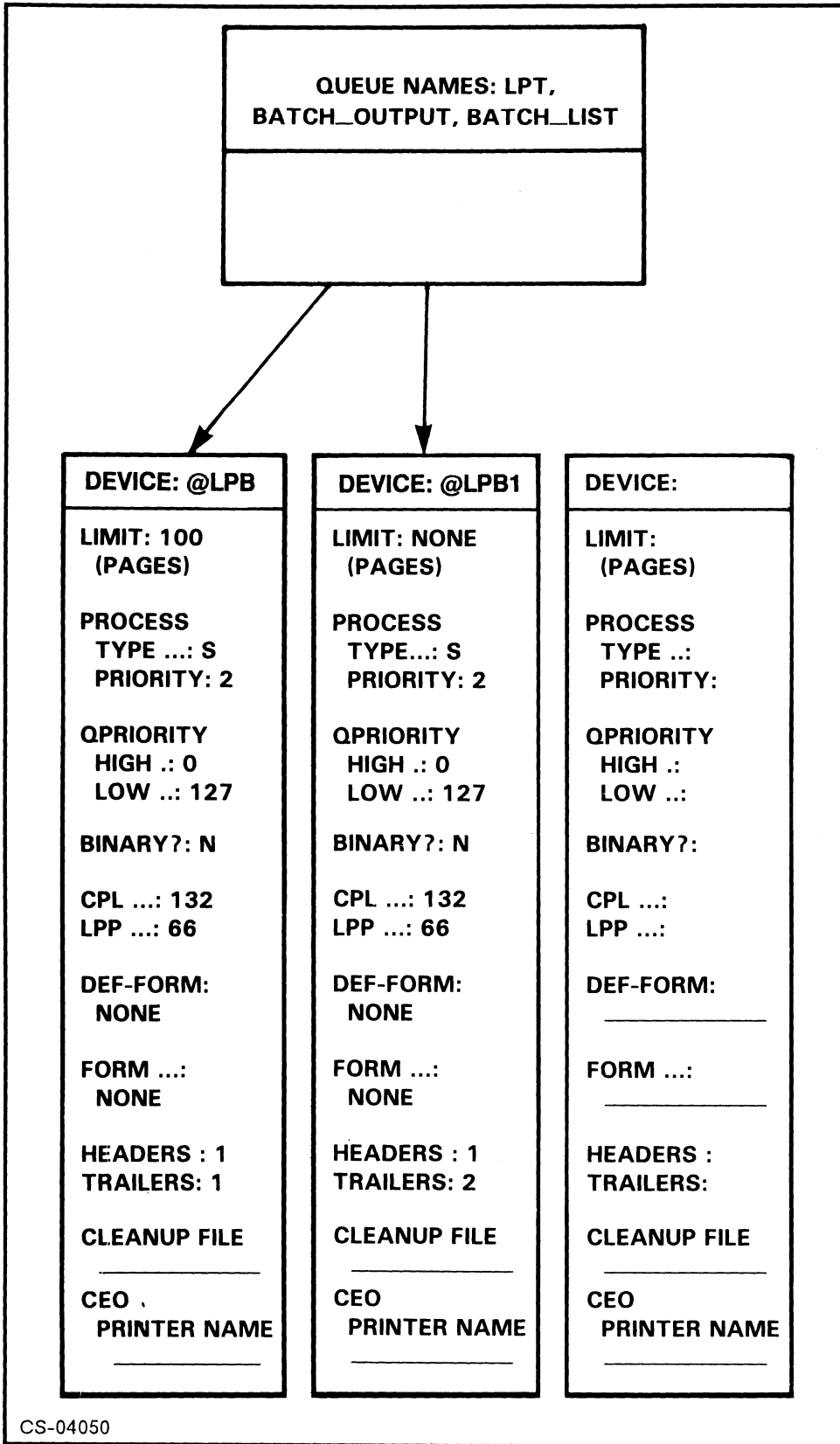


Figure 8.12

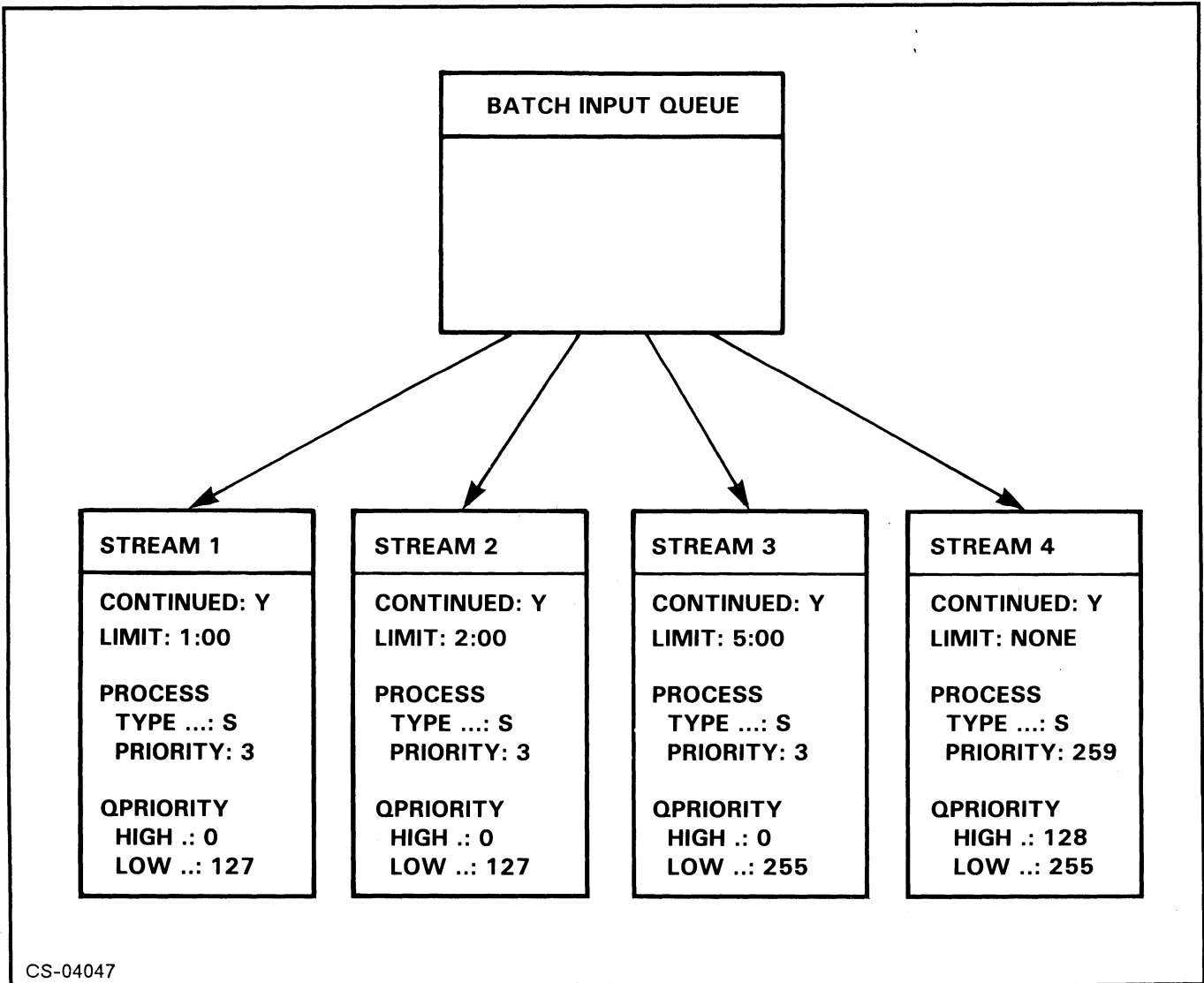


Figure 8.13

Handwritten notes:
 Stream 1: SPRINT, PRIORITY, QPRIORITY
 Stream 2: PRIORITY, QPRIORITY
 Stream 3: PRIORITY, QPRIORITY
 Stream 4: PRIORITY, QPRIORITY

DIRECTORY, DATABASE, OR FILE NAME	CRITICALITY (1-5)	VOLATILITY (1-5)	ALTERNATE MEDIA AVAILABLE/ OFFSITE?	FREQUENCY	
				ARCH	INCR
D.G. SYSTEM & UTILITIES	1	5	D.G.; & ON/OFFSITE	1/ REV	1/ UPDATE
FUDGIT SOFTWARE	1	5	FUDGIT; & ON/OFFSITE	1/ REV	NONE
BUS.COB	3	3	OFFSITE CURRENT	1/ WEEK	1/ DAY
BUS.DATA	1	1	OFFSITE CURRENT	3/ WEEK	1/ SHIFT
BUS.PROD	1	4	OFFSITE CURRENT	1/ WEEK	1/ REV
RD.F77	3	3	OFFSITE CURRENT	1/ WEEK	1/ DAY
RD.DATA	2	2	OFFSITE CURRENT	1/ WEEK	1/ DAY
RD.PROD	2	4	OFFSITE CURRENT	1/ WEEK	1/ REV
Q.A.	5	3	OFFSITE CURRENT	1/ WEEK	1/ DAY
UDD	3	2	OFFSITE CURRENT	1/ WEEK	1/ DAY
CEO_FILES	2	2	OFFSITE CURRENT	2/ WEEK	1/ DAY
CEO_NSA	2	4	OFFSITE CURRENT	1/ MONTH	1/ WEEK
CEO_MAIL	4	1	OFFSITE CURRENT	2/ WEEKS	1/ DAY

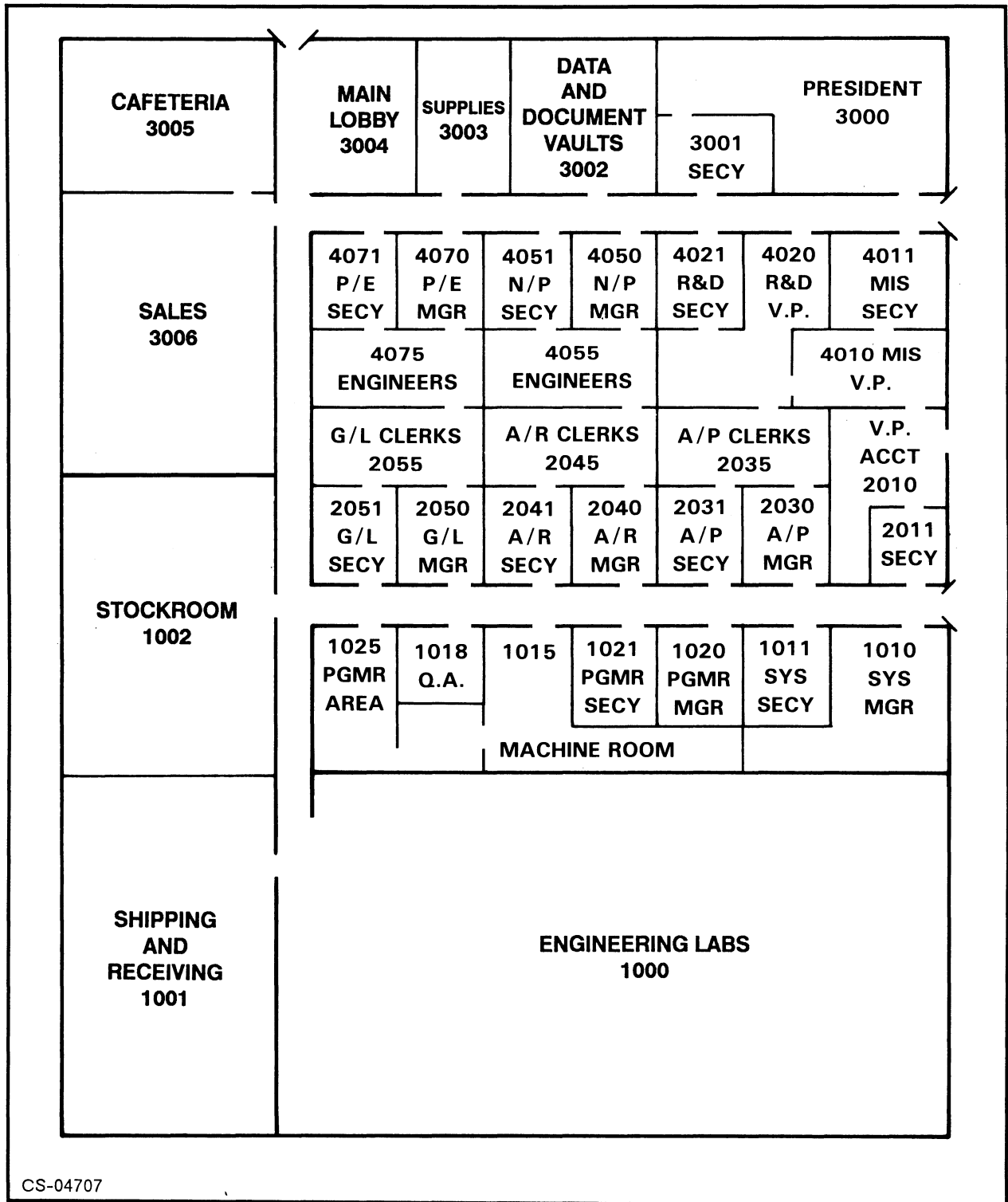
CS-04052

Figure 8.14

OUTPUT DEVICES	LOCATION	USER(S) ALLOWED ACCESS
<p style="text-align: center;">LPB 300 LPM LINE PRINTER</p>		
<p style="text-align: center;">LPB1 1200 LPM LINE PRINTER</p>		
<p style="text-align: center;">@CON16 LASER PRINTER</p>		
<p style="text-align: center;">@CON33 LASER PRINTER</p>		
<p style="text-align: center;">@CON49 LASER PRINTER</p>		
<p style="text-align: center;">@CON65 LASER PRINTER</p>		

CS-04048

Figure 8.15

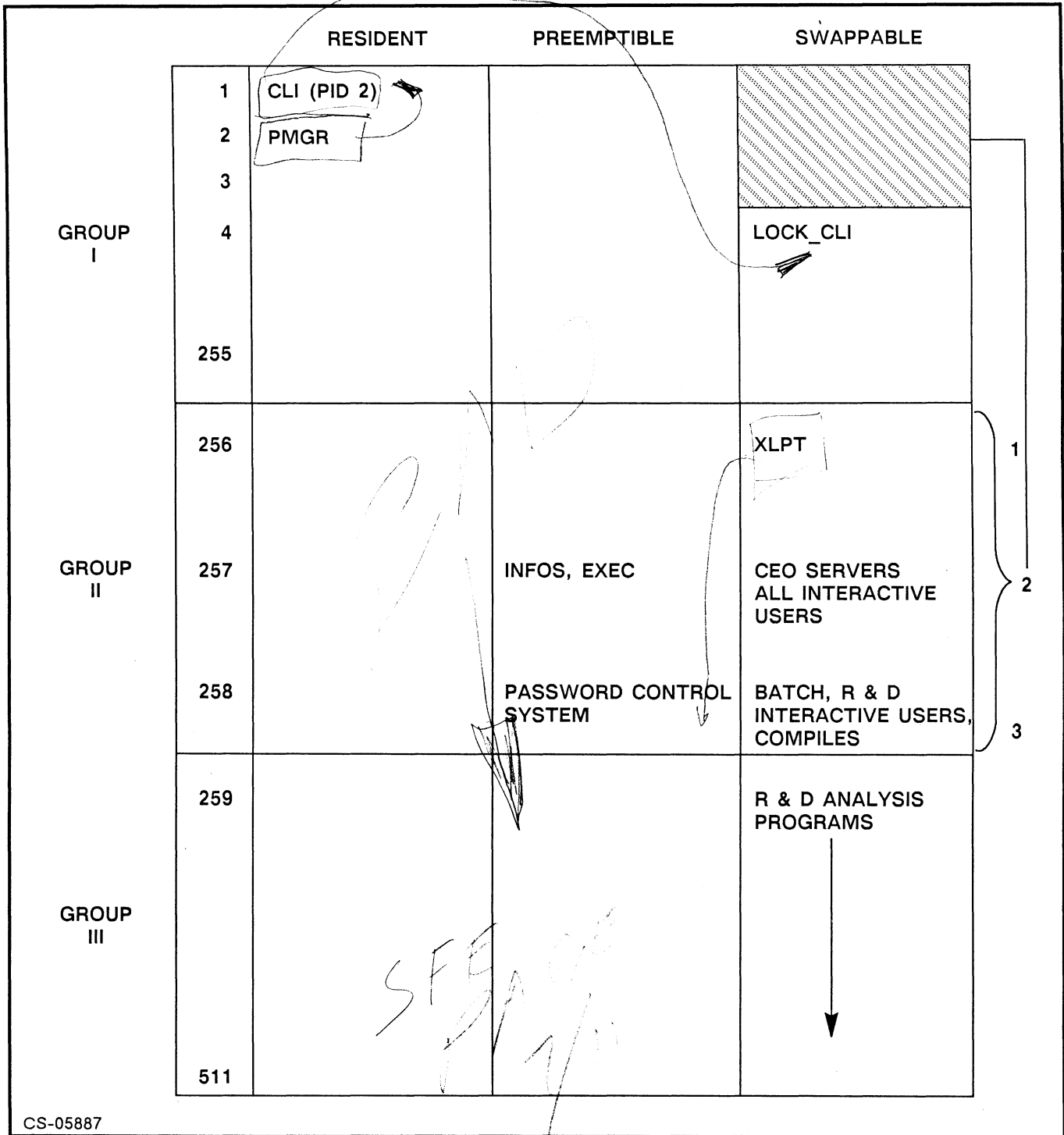


CS-04707

Figure 8.16

You have four laser printers. You have been asked to select where they should be placed. In what rooms would you put them?

Process Group Layout Sheet



CS-05887

Figure 8.17

PENGUIN's Disk Loading

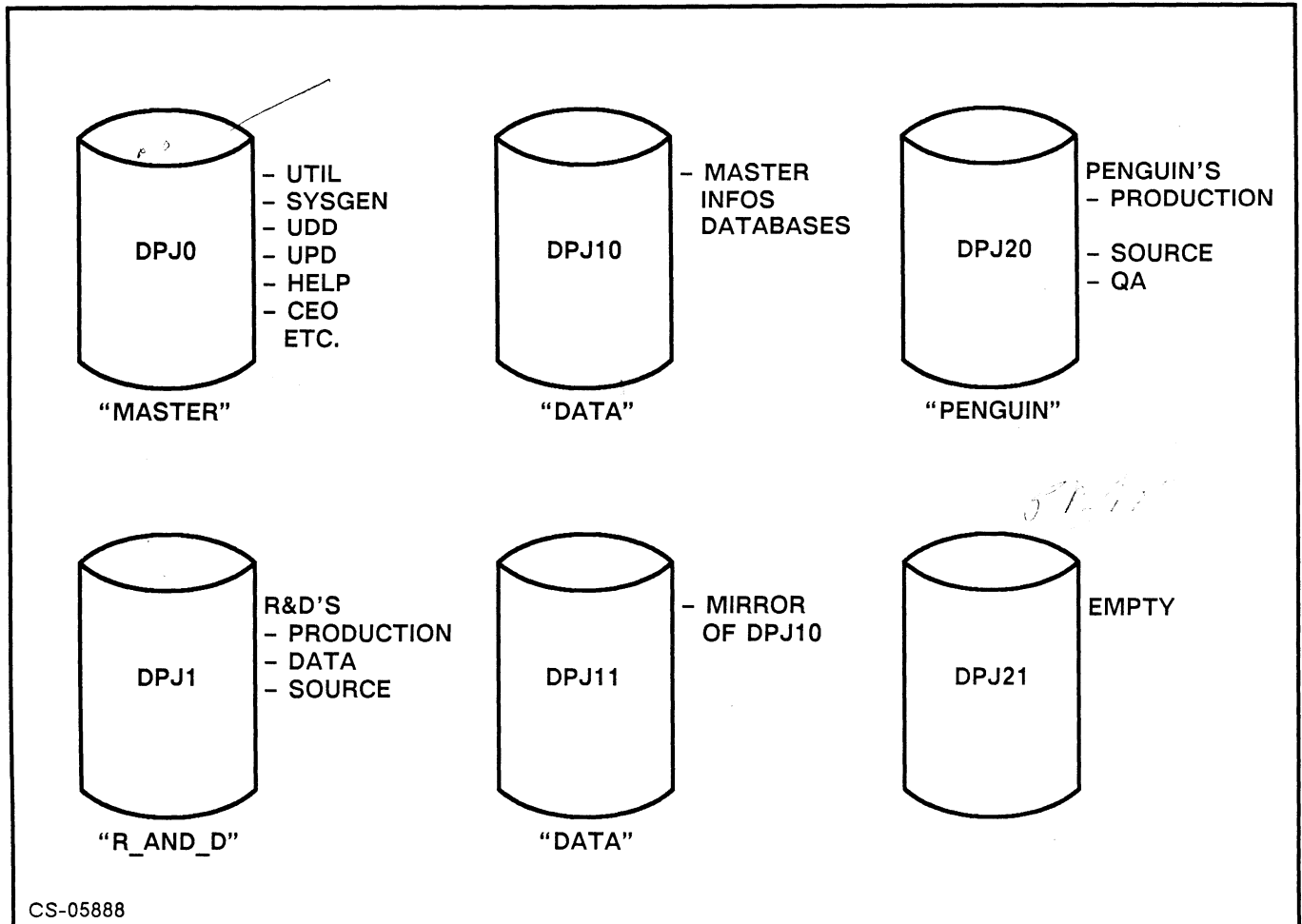


Figure 8.18

Considerations in Disk Loading

- Drive speed
- Drive capacity
- Access rate
- Failure history
- DISCO statistics

Disaster/Recovery Planning

PENGUIN's management is very convinced that a disaster plan is necessary in the event MIS, or even the business as a whole is interrupted for a long period of time.

Plan Objectives

- Ensure business survival until the disaster is overcome
- Protect assets
- Minimize recovery time

Statistics

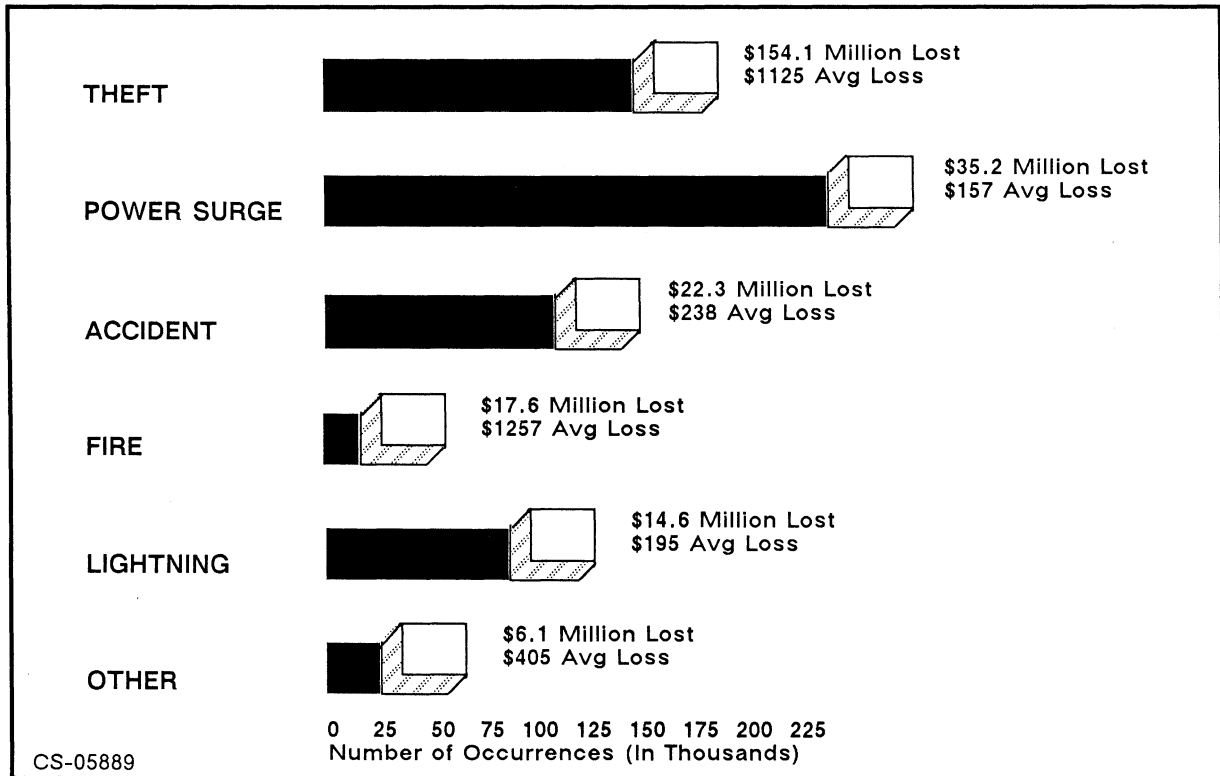


Figure 8.19 1986 Loss Study by Safeware, Inc.

Sources of Help

- Data General
- Auditors
- Technical seminars
- Books on the subject

Security Planning

Frequent Causes of System Losses

- Accidents
- Malicious destruction **A**

Open Shops

- No access control
- Enforcement by peer pressure
- Productivity higher due to fewer procedural tasks
- Loss risk high
- No focus of responsibility

Closed Shops

- Strict access control
- Strict enforcement
- Procedures reduce productivity
- Loss risk minimal
- Single focus of responsibility - YOU!

Security

Physical Hardware Security Methods

- Cipher locks
- Card key systems
- Retinal scan systems
- Lock and key ✓
- Voice/fingerprint entry systems

Hardware

- CPU
- Disk drives
- Op console
- Tape drives
- Printers
- Terminals

TAPE DRIVE ACCESS

Data

- Tape libraries
- Old reports
- Inventories of backups

Software

- Documentation
- Source code listings
- Secondary passwords

AOS/VS

- User profiles
- Encrypted passwords
- LOCK_CLI

External security

- XODIAC
- Modem privileges
- Answer-back modems
- Hackers/unauthorized users
- Viruses/worms

Trusted Computer Base Activity	Closed	Medium-Security	Open
Can users access files without leaving tracks (records in a log file)?	No	Maybe	Yes
Can one account be used by the general public (is there a public account)?	No	Yes	Yes
Can users learn the names of other users' files?	No	Maybe	Yes
Can remote users learn the names of other users' files?	No	No	Yes
Can users read and copy other users' files?	No	Maybe	Yes
Can users read other users' electronic mail?	No	No	Yes
Can users change or delete other users' files?	No	No	Yes
Can users gain access to tape or diskette units without operator intervention?	No	Maybe	Yes
Can users consume system resources by writing personal letters or playing games?	No	Maybe	Yes
Can users log on as other users?	No	No	Maybe
Can users give themselves additional privileges?	No	No	Maybe

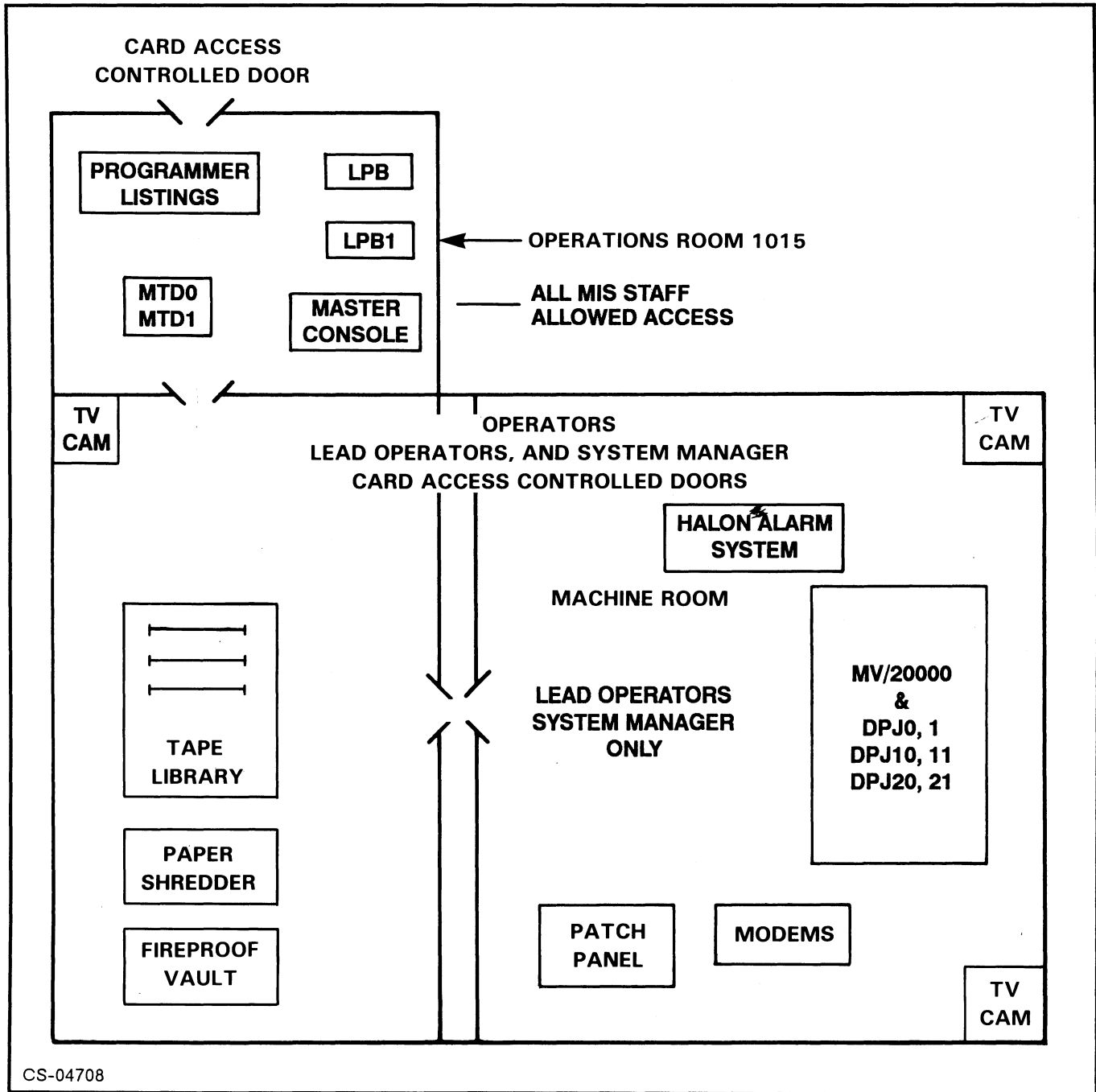


Figure 8.20 Penguin's Computer Room

MODULE 9

System Utilities

Objectives

Upon completion of this module, the student should be able to:

1. Use PED to monitor processes.
2. Use DISCO to monitor disk utilization.
3. Activate the system logging functions.
4. Create reports on system utilization using the REPORT utility.
5. Use LOCK_CLI to secure the system console from unauthorized use.

PED

- PED, the Process Environment Display program, displays information about processes currently in use.
- Optional switches control the display format, cycle time, and those PIDs which are displayed.
- Execution:)X PED[/optional switches]

PID	M	USERNAME	PROCESS	PROGRAM	ELAPS	CPU	CPS	BS	IO/S	FTAS	PRI	WSS
1	*	PMGR	PMGR	PMGR	1/57	10.68	1		0	0	1	166
3	#	OP	EXEC	EXEC	1/57	7.59	2	B	0	0	20	336
11	*	OP	XTS	XTS	1/55	10.18	0		0	0	10	164
12	*	OP	SVTA	SVTA	1/55	6.03	1	B	0	0	90	69
14	*	OP	MTA	MTA	1/54	1.79	0	B	0	0	40	232
29		RWM.S219	CON19	CLI	1/25	0.14	0	B	0	0	2	106
31		DOUG.S21	CON24	CLI	1/09	3.12	0	B	0	0	2	116
33		JOE	00033	PED	2:12	0.32	4		0	0	2	114

PED Rev 7.64.00.00 Thursday 23-Mar-89 9:36:21 AM

Note: Active PIDS are displayed as bright on screen.

PED displays elapsed and CPU time in the following format:

DD-HH	5 days, 2 hours	Displayed as	5-02
HH/MM	4 hours, 53 minutes	Displayed as	4/53
MM:SS	46 minutes, 13 seconds	Displayed as	46:13
SS.hh	50.00 seconds	Displayed as	50.00

If the time exceeds 99-23 (99 days 23 hours), ***** appears.

If a number will not fit in its field:

- Divided by 1000 and K placed after it.
- Divided by 1,000,000 and M placed after it.

PED Commands

A Toggle /ALL status
 C Push to a CLI
 E Exit (also B or Q)
 H Help (this text)
 M Menu screen
 R Refresh screen
 ^Q Resume updates
 ^S Suspend updates
 < Decrement sleep time
 = Reset sleep time to 10
 > Increment sleep time
 ^ Increment minpid by 5
 V Decrement minpid by 5
 [Decrement range by 20
] Increment range by 20
 { Scroll down inside range by 5
 } Scroll up inside range by 5

PED Menu Default Settings

Cursor positioning chars: U - up D - down L - left R - right
 Switch selection chars: Y - yes N - no S - default switches
 Misc: SPACE - refresh screen BREAK/ESC - exit this menu

1	BS	Y	15	FTL	29	PRIVbitS	43	sysMgr
2	Class ID		16	FTLS	30	PROCESS	Y 44	tsE
3	CLASSNAM		17	FTP	31	PROGRAM	Y 45	ULocal
4	CPU	Y	18	FTPS	32	PRTYPE	46	US
5	CPUS	Y	19	IO	33	PSW	47	US3
6	ELAPSeD	Y	20	IOS	Y 34	SH	48	US4
7	Father P		21	IRec	35	SH3	49	US5
8	FLAG 1		22	MProcess	36	SH4	50	US6
9	FLAG 2		23	PaGeSEC	37	SH5	51	US7
10	FLAG 3		24	PID	Y 38	SH6	52	USERNAME Y
11	FLAG 4		25	Pid SiZe	39	SH7	53	WSS Y
12	FLAG 5		26	PLocal	40	SubsLice	54	WSsMAX
13	FTA		27	PNQ	41	suprMode	Y 55	WSsMIN
14	FTAS	Y	28	PRlority	Y 42	supPrivg		

Width is 76

DISCO Disk Monitor Display Program

- Displays information on currently initialized disks.
- Requires CHANGE TYPE privilege to run RESIDENT.

)X DISCO

```

Mar 13,1989                AOS/VS DISC MONITOR PROGRAM                11:46:08
                                Function key #11 to Exit
-----
Actual time    0.0 seconds                Cycle time    10 seconds
  U
  D n
  e i  # of  % of  % of  % of  Avg/Max  Avg  Blocks  Blocks  % of  Avg  Avg
  v t  Reqs Total  Busy Intf  Queue  Seek  Read  Written Util Time Time
-----
27  0 19831  36.0  27.4  0.0  1.29 13  92.5  20197  28855  3.5  .026  .034
27  1 24187  44.0  20.9  0.3  1.17 11  67.3  45329  23213  3.8  .023  .027
67  0 10924  19.8  10.1  0.0  1.07  7  41.0  31453   4406  2.1  .028  .030
  
```

Per Cycle Screen

```

Mar 13,1989                AOS/VS DISC MONITOR PROGRAM                11:46:08
                                Function key #11 to Exit
-----
Actual time    0.0 seconds                Cycle time    10 seconds
  U
  D n
  e i  # of  % of  Reqs  % of  % of  Avg/Max  Avg  Blocks/sec
  v t  Reqs Total  per  Busy Intf  Queue  Seek  Read Write
-----
27  0     0  0.0  0.0  0.0  0.0  0.00/ 0  0.0  0.0  0.0
27  1     0  0.0  0.0  0.0  0.0  0.00/ 0  0.0  0.0  0.0
67  0     0  0.0  0.0  0.0  0.0  0.00/ 0  0.0  0.0  0.0
  
```

DISK USE

DISCO Column Descriptions

Dev	Device code of the disk.
Unit	Unit number of the disk.
# of Reqs	Number of I/O requests made to this disk.
% of Total	Percent of all I/O performed by this disk.
% of Busy	Percent of I/O's made while 1 or more requests were waiting in the queue.
% of Interference	Percent of requests made when the controller was busy.
Avg/Max Queue	Average and maximum waiting queue requests.
Avg Seek	Average number of cylinders crossed to satisfy an I/O.
Blocks Read	Total number of blocks read.
Blocks Written	Total number of blocks written.
% of Utilization	Percent of time disk found busy.
Avg Service Time	Average time to satisfy a request.
Avg Response Time	$(1 + \text{Avg Queue Length}) \times \text{Avg Serv Time}$.

DISCO Help Screen

^	Scroll DISCO disk display up by two lines
V	Scroll DISCO disk display down by two lines
<	Decrement DISCO cycle time
>	Increase DISCO cycle time
H or ?	To display this screen
L	To toggle logging on or off
R	To refresh the screen
S	To toggle between the two DISCO screens
T	To toggle listing on or off
Z	To reset the data to zero
F11	To exit DISCO

System Logging

- SYSLOG *OPTIONAL*
- ERROR_LOG *ALWAYS THERE*

When on, SYSLOG records:

- User information.
- XODIAC information.
- Hardware information for ERROR_LOG.
- Manually entered information through LOGEVENT.

ERROR_LOG is always on, receiving information from the hardware.

SYSLOG formats:

- SYSLOG
- SYSLOG old_log_filename

```
/START[/DETAIL=[MINIMAL,FULL]]  
/STOP  
/NOSOFTTAPEERRORS or, (/SOFTTAPEERRORS)  
/RENAMERROR old_error_log_filename
```

MUCH DETAIL

- Must be started by PID 2.

Report

The AOS/VS utility REPORT is used to generate system utilization statistics and security information.

) X REPORT[/switches] logfile

Often Used Command Switches

/BEFORE=date:time	For date/time range reporting
/AFTER=date:time	For date/time range reporting
/FAILED_LOGONS	Lists all bad logon attempts
/TRACE=username	Trace the activities of user or template
/FILE=full pathname	Lists all activities on that file
/USER=username	Reports accounting information like CPU
/EV	Reports on manual log entries (LOGEVENT)
/CT	Connect time information
/DE	Device error report
/ME	Memory error report

- REPORT can be run on :SYSLOG, :ERROR_LOG or syslog files
- REPORT can run on :SYSLOG while it is open, log need not be stopped

EVENT LOG DUMP

12-OCT-88 12:03:53 *** SYSLOG STARTED ***
 12-OCT-88 12:04:24 Manual Log Entry -- Started SYSLOG with /DETAIL=FULL

13-OCT-88 10:03:10 *** SYSLOG STOPPED ***

DEVICE SUMMARY FROM FILE(S): :ERROR_LOG

DEVICE CODE	UNIT	HARD	ERRORS SOFT	TIMEOUT
POWER FAILS		1		
22	0	5	28	0

USER SUMMARY FROM FILE(S): 12OCT88

USERNAME	CONNECT CONSOLE	TIME UNIT	PAGES PRINTED	CPU TIME	I/O BLOCKS	PAGE SECS	NUMBR PROCS
BILL	0:22	0:00	0	0:00:02.643	60	253	4
*CREATE	0:01	0:00	0	0:00:00.648	153	48	17
FIMA,SM30	0:42	0:00	0	0:00:22.284	4085	3175	17
*JOE	0:04	0:00	0	0:00:03.434	64	333	10
KEVIN.SM230	0:01	0:00	0	0:00:15.833	3324	1980	9
MARIA.SM230	0:59	0:00	13	0:00:04.494	326	503	3
OP	0:00	0:00	0	0:00:01.582	21	112	2
PHILIP.SM230	0:39	0:00	2	0:00:01.043	69	135	2
RUSTY.SM230	1:00	0:00	0	0:00:15.875	655	1659	2
VXBOB	0:59	0:00	74	0:00:10.863	1869	1309	7
WALTER.S209	0:00	0:00	0	0:00:02.140	0	215	1
YVONNE.SM230	0:59	0:00	15	0:00:10.014	750	1392	5

CONSOLE CONNECT TIME DUMP

	CONNECT TIME	USERNAME	CONNECT TIME	DEVICE
12-OCT-88	15:41:37	CREATE	0:01	CON12
12-OCT-88	15:52:07	FRAASE.S219VS	0:05	CON14
12-OCT-88	15:54:14	BOB.S219VS	0:14	CON6
12-OCT-88	15:56:38	PAUL	0:01	CON13
12-OCT-88	15:57:24	CREATE	0:01	CON13
12-OCT-88	16:04:45	ENBERG	0:05	CON5
12-OCT-88	16:06:12	BOB.S219VS	0:11	CON6
12-OCT-88	16:07:19	DCL.S219	0:13	CON11
12-OCT-88	17:10:33	ENBERG	0:01	CON12
12-OCT-88	17:10:53	ENBERG	0:01	CON12
12-OCT-88	17:11:06	ENBERG	0:01	CON12
12-OCT-88	17:11:40	***SYSLOG STOPPED***		

13-Oct-1988 10:10:22 AOS/V5 REPORT REV 7.60.00.00

FAILED LOGON DUMP

	USERNAME	CONSOLE NAME
12-OCT-88 12:03:53	*** SYSLOG STARTED ***	
12-OCT-88 12:04:37	SALLY	CON39
12-OCT-88 12:04:40	SALLY	CON39
12-OCT-88 12:04:42	SALLY	CON39
12-OCT-88 12:04:44	SALLY	CON39
12-OCT-88 12:04:49	OP	CON39
12-OCT-88 12:05:13	OP	VCON1
12-OCT-88 12:05:15	OP	VCON1
12-OCT-88 12:05:19	CEO_MGR	VCON1
12-OCT-88 12:05:21	SYSMGR	VCON1
12-OCT-88 12:52:37		VCON3
12-OCT-88 13:05:30	RSW/S105VS	CON21
12-OCT-88 15:06:53	JRUBY.S101VS	CON23
12-OCT-88 15:24:58	SIUJAR	CON23
12-OCT-88 15:25:03	JRUBY.S105VS	CON23
12-OCT-88 16:34:22		CON20
12-OCT-88 16:34:22		CON20
12-OCT-88 16:34:23		CON20
12-OCT-88 16:34:23		CON20
12-OCT-88 16:34:23		CON20
12-OCT-88 16:38:13	S101VS	CON20
13-OCT-88 8:43:42	DD	CON22
13-OCT-88 8:43:44		CON22
13-OCT-88 9:47:58	KJC.S101VS	CON27
13-OCT-88 9:48:09	KJC.S101VS	CON27
13-OCT-88 10:03:10	*** SYSLOG STOPPED ***	

13-Oct-1988 10:10:22 AOS/V5 REPORT REV 7.60.00.00

FILE ACCESS DUMP

	USERNAME	ACTION	PATHNAME
12-OCT-88 12:03:53	*** SYSLOG STARTED ***		
12-OCT-88 12:03:53	AOS/V5 REV 7.60.0.0		
12-OCT-88 12:03:53	SYSLOG STOP-START GAP, PID AND PATHNAME TABLES CLEARED		
12-OCT-88 13:14:23	JEFF	OPENED	FILE :UPD
12-OCT-88 15:45:59	MATTIE	OPENED	FILE :UPD
12-OCT-88 15:47:10	MATTIE	OPENED	FILE :UPD
12-OCT-88 15:47:28	MATTIE	OPENED	FILE :UPD
12-OCT-88 15:54:55	MATTIE	OPENED	FILE :UPD
13-OCT-88 8:14:42	TML.S105VS	OPENED	FILE :UPD ERROR: Directory access
13-OCT-88 9:44:13	MICHELLE	OPENED	FILE :UPD
13-OCT-88 9:44:13	MICHELLE	CLOSED	FILE :UPD
13-OCT-88 9:44:25	MICHELLE	OPENED	FILE :UPD
13-OCT-88 9:44:25	MICHELLE	CLOSED	FILE :UPD
13-OCT-88 9:44:28	MICHELLE	OPENED	FILE :UPD
13-OCT-88 9:44:28	MICHELLE	CLOSED	FILE :UPD
13-OCT-88 9:44:33	MICHELLE	OPENED	FILE :UPD
13-OCT-88 9:44:47	MICHELLE	CLOSED	FILE :UPD
13-OCT-88 10:03:10	*** SYSLOG STOPPED ***		

13-Oct-1988

10:36:17

AOS/V5 REPORT REV 7.60.00.00

TRACE USERS DUMP

	USERNAME	ACTION
12-OCT-88 12:03:53	***	SYSLOG STARTED ***
12-OCT-88 12:03:53	AOS/V5	REV 7.60.0.0
12-OCT-88 12:03:53	SYSLOG	STOP-START GAP, PID AND PATHNAME TABLES CLEARED
12-OCT-88 13:07:51	JEFF	PROCESS CREATED :CLI.PR
12-OCT-88 13:07:52	JEFF	(ring 3, port 2050) sent an IPC to PID_1
12-OCT-88 13:07:52	PID_1	PERMITTED ACCESS TO JEFF FROM RING 3 TO
12-OCT-88 13:07:52	JEFF	SUBSEQUENT SHARED FILE OPEN FROM RING 3
12-OCT-88 13:07:52	JEFF	OPENED FILE :CLI.OL
12-OCT-88 13:07:52	JEFF	OPENED FILE :PER:OUTPUT
12-OCT-88 13:07:52	JEFF	CLOSED FILE :PER:OUTPUT
12-OCT-88 13:07:52	JEFF	OPENED FILE :PER:VCON4
12-OCT-88 13:07:52	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:07:52	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:07:52	JEFF	OPENED FILE :PER:INPUT
12-OCT-88 13:07:52	JEFF	CLOSED FILE :PER:INPUT
12-OCT-88 13:07:52	JEFF	OPENED FILE :PER:VCON4
12-OCT-88 13:07:52	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:07:52	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:07:52	JEFF	SUPERPROCESS TURNED OFF
12-OCT-88 13:07:52	JEFF	SUPERUSER TURNED OFF
12-OCT-88 13:07:52	JEFF	SYSMGR event 1
12-OCT-88 13:07:52	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:02	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:02	JEFF	OPENED FILE :UPD:JOHN
12-OCT-88 13:15:02	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:11	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:12	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:13	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:13	JEFF	PROCESS TERMINATED :UTIL:DISPLAY.PR
12-OCT-88 13:15:13	JEFF	OPENED FILE :PER:LIST
12-OCT-88 13:15:13	JEFF	CLOSED FILE :PER:LIST
12-OCT-88 13:15:13	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:13	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:14	JEFF	SYSMGR event 1
12-OCT-88 13:15:14	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:15	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:15	JEFF	(ring 3, port 2050) sent an IPC to PID_10
12-OCT-88 13:15:20	JEFF	PROCESS CREATED :UTIL:DISPLAY.PR
12-OCT-88 13:15:21	JEFF	(ring 3, port 2050) sent an IPC to PID_1
12-OCT-88 13:15:21	PID_1	PERMITTED ACCESS TO JEFF FROM RING 3 TO
12-OCT-88 13:15:21	JEFF	SUBSEQUENT SHARED FILE OPEN FROM RING 3
12-OCT-88 13:15:21	JEFF	OPENED FILE :PER:OUTPUT
12-OCT-88 13:15:21	JEFF	CLOSED FILE :PER:OUTPUT
12-OCT-88 13:15:50	PID_10	TERMED PROCESS :CLI.PR OF JEFF
12-OCT-88 13:15:50	JEFF	PROCESS TERMINATED JEFF:00030
12-OCT-88 13:15:50	JEFF	PROCESS TERMINATED JEFF:VCON5
13-OCT-88 10:03:10	***	SYSLOG STOPPED ***

DEVICE ERROR DUMP

	DEVICE CODE	UNIT	STATUS		RETRIES	TYPE
30-AUG-88	12:37:31		*** SYSLOG STARTED ***			
31-AUG-88	15:32:13		*** SYSLOG STOPPED ***			
31-AUG-88	16:24:00		*** SYSLOG STARTED ***			
14-SEP-88	14:49:14	22	0	106101 103421	1	SOFT
16-SEP-88	9:58:10		*** SYSLOG STOPPED ***			
16-SEP-88	10:06:00		*** SYSLOG STARTED ***			
16-SEP-88	10:14:00		*** SYSLOG STOPPED ***			
16-SEP-88	10:16:00		*** SYSLOG STARTED ***			
19-SEP-88	9:05:01	22	0	106105 103421	13	HARD
19-SEP-88	9:05:55	22	0	106105 103421	13	HARD
19-SEP-88	9:06:07	22	0	106105 103421	13	HARD
19-SEP-88	9:06:30	22	0	106105 103421	13	HARD
23-SEP-88	12:45:52		*** SYSLOG STOPPED ***			
27-SEP-88	16:39:00		*** SYSLOG STARTED ***			
30-SEP-88	14:44:43	22	0	106105 103421	13	HARD
2-OCT-88	15:48:37		*** SYSLOG STOPPED ***			
2-OCT-88	3:50:00		*** SYSLOG STARTED ***			
2-OCT-88	15:58:13	22	0	106103 103521	2	SOFT
2-OCT-88	15:58:18	22	0	106101 103421	1	SOFT
2-OCT-88	15:58:23	22	0	106103 103521	1	SOFT
2-OCT-88	15:58:24	22	0	106101 103421	1	SOFT
2-OCT-88	15:58:27	22	0	106103 103521	2	SOFT
2-OCT-88	15:58:29	22	0	106103 103521	2	SOFT
2-OCT-88	15:58:31	22	0	106101 103421	1	SOFT
2-OCT-88	15:58:33	22	0	106101 103421	1	SOFT
2-OCT-88	15:58:35	22	0	106101 103421	1	SOFT
2-OCT-88	15:58:36	22	0	106101 103421	1	SOFT
2-OCT-88	16:00:26	22	0	106101 103421	1	SOFT
2-OCT-88	16:00:40	22	0	106101 103421	2	SOFT
2-OCT-88	16:00:45	22	0	106101 103421	2	SOFT
2-OCT-88	16:00:50	22	0	106103 103521	1	SOFT
2-OCT-88	16:00:52	22	0	106101 103421	1	SOFT
2-OCT-88	16:00:54	22	0	106103 103521	2	SOFT
2-OCT-88	16:00:58	22	0	106101 103421	1	SOFT
2-OCT-88	16:01:00	22	0	106103 103521	2	SOFT
2-OCT-88	16:01:01	22	0	106103 103521	2	SOFT
2-OCT-88	16:01:02	22	0	106101 103421	1	SOFT
2-OCT-88	16:02:18	22	0	106103 103521	1	SOFT
2-OCT-88	16:02:32	22	0	106101 103421	2	SOFT
2-OCT-88	16:02:41	22	0	106101 103421	2	SOFT
2-OCT-88	16:02:46	22	0	106101 103421	1	SOFT
2-OCT-88	16:02:50	22	0	106103 103521	2	SOFT
2-OCT-88	16:02:51	22	0	106101 103421	2	SOFT
2-OCT-88	16:02:53	22	0	106101 103421	2	SOFT
2-OCT-88	16:04:17		*** SYSLOG STOPPED ***			
2-OCT-88	16:05:00		*** SYSLOG STARTED ***			
2-OCT-88	16:06:19		*** SYSLOG STOPPED ***			
2-OCT-88	16:16:00		*** SYSLOG STARTED ***			
3-OCT-88	9:57:56		*** SYSLOG STOPPED ***			
5-OCT-88	8:17:10		*** SYSLOG STARTED ***			
9-OCT-88	10:46:17		*** SYSLOG STOPPED ***			

LOCK_CLI

LOCK_CLI is a special CLI designed to protect access to PID 2. When unlocked, it performs as normal. When locked, the following commands will not function:

BLOCK	BYE	CHAIN
CONNECT	COPY	DEBUG
DELETE	DUMP	ENQUEUE
EXECUTE	INITIALIZE	JPINIT
JPRELEASE	LOAD	LOCALITY
MOVE	PROCESS	QBATCH
QPLOT	QPUNCH	QSUBMIT
RELEASE	RENAME	SUPERPROCESS
SUPERUSER	TERMINATE	XEQ
^C^B	^C^E	^D^D

These commands will not function as they do normally while locked:

ACL

QPRINT

REVISION

TYPE

LOCK_CLI starts running locked. To unlock it, the UNLOCK command is used. LOCK_CLI will wait, while the unechoed password is entered. In either case, wrong or right, just a prompt is returned.

The default password is PASSWORD.

MODULE 10

System Problems and Data General Support

Objectives

Upon completion of this module, the student should be able to:

1. Recognize the difference between system panics, traps, and deadlocks.
2. Respond correctly to system panics, traps, and deadlocks.
3. Use the emergency shutdown (ESD) facility.
4. Use the FIXUP utility.
5. Submit a properly documented Software Trouble Report.
6. State the various Data General support services.

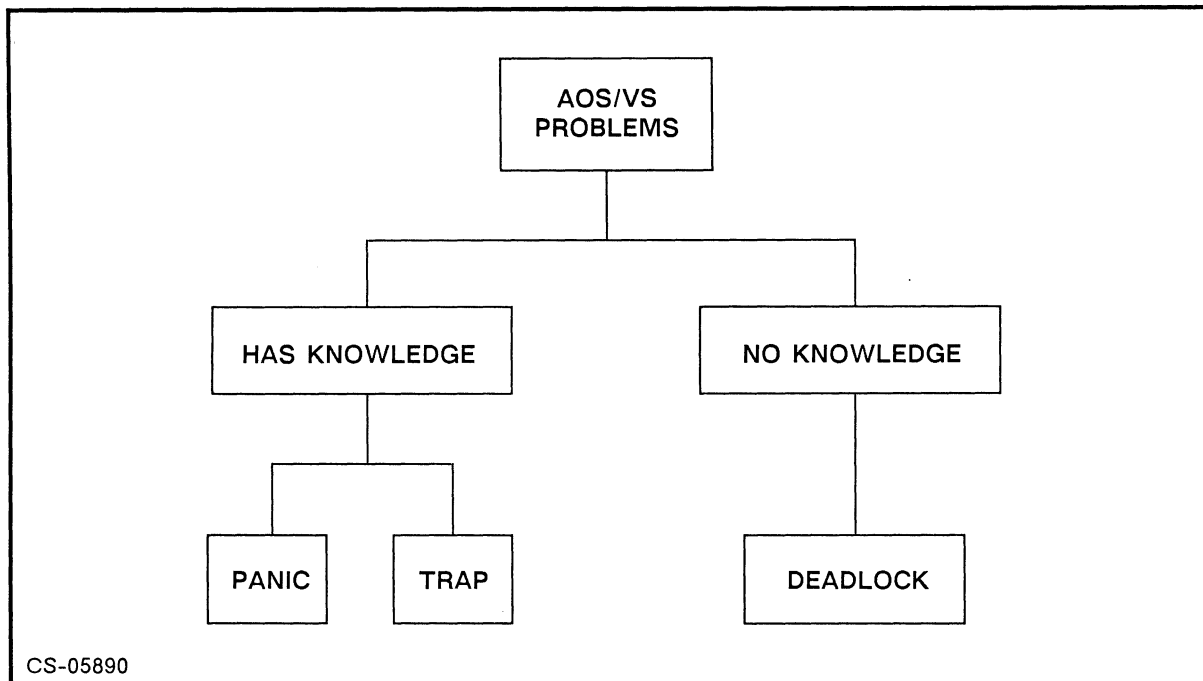


Figure 10.1 Classes of System Errors

Traps

Failure of a user program, caused by an attempt to:

- Read, write, or execute code protected against any of these actions.
- Refer to an address outside of user space, or an invalid address.
- Use more than 16 levels of indirect addressing.
- Issue an I/O instruction while I/O mode is not enabled.
- Transfer control to a lower ring illegally.

Process traps are hardware errors, and really not a problem related to AOS/VS. Users should notify the system manager of their occurrence.

AOS/VS Action

- Terminates process.
- Produces a BREAKFILE in [!DIR/I] of process

?013.13_06_12.BRK
↑ ↑
PID TIME

MESSAGE

ABORT
USER TRAP, "message"

C	PC	ACO	AC1	AC2	AC3
n	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn	nnnnnnnnnn

ACTION

- Record message
- Save breakfile

Panics

- Caused by an error that AOS/VS recognizes but can't fix. It could be hardware or software.
- AOS/VS terminates:

FATAL AOS/VS ERROR: 7300

```

0000000002      1600000502      1600002157      0000000000
0000043611      0000000003      1600043611      0000000000
00000142022     00000142066     00000143154     00000142006
Do you want a memory dump (to submit a Software Trouble Report)? [Y]
  
```

```

7300             - octal panic code
values 1-8       - additional panic information
00000142022     - hardware stack pointer value
00000142066     - hardware frame pointer value
00000143154     - hardware stack limit value
00000142066     - hardware stack base value
  
```



In `:UTIL` is `AOSVS.PANICS.SR`, a list of panic codes and descriptions. This is the description for the above panic:

PANIC CODE	ROUTINE	PANIC DESCRIPTION
7300	STRP	AOS/VS TOOK A PROTECTION FAULT INSIDE THE SYSTEM. VALUE #1= AC0 @ TRAP VALUE #2= AC1 @ TRAP VALUE #3= AC2 @TRAP VALUE #4= FP @ TRAP VALUE #5= PC OF INSTRUCTION CAUSING TRAP VALUE #6= TRAP CODE

- 0 READ VIOLATION
- 1 WRITE VIOLATION
- 2 EXECUTE VIOLATION
- 3 VALIDITY PROTECTION (SBR OR PTE)
- 4 INWARD ADDRESS REFERENCE
- 5 DEFER (INDIRECT) VIOLATION
- 6 ILLEGAL GATE
- 7 OUTWARD CALL
- 10 INWARD RETURN
- 11 PRIVILEGED INSTRUCTION
- 12 I/O PROTECTION VIOLATION
- 13 *NOT DEFINED*
- 14 INVALID MICROINTERRUPT RETURN BLOCK
- 15 UNIMPLEMENTED INSTRUCTION

Operator Action

- Produce a memory dump (ESD).
- If ESD fails to achieve normal SYSTEM SHUTDOWN, run FIXUP.
- Reboot the system.
- Use COPY to put the SYSTEM.ST on File 1.

System Deadlock

Symptoms

- No response on user's console.
- Little or no CPU activity.
- A process does not respond to a ^C^B, or a ^C.

Causes

- A malfunctioning high-priority process.
- Too many batch streams in use simultaneously.
- A normally functioning process with priority set too high.

Solution

- Try the obvious: ^Q, ^S, the HOLD button, connector.
- Try to block any suspected malfunctioning process.
- Lower the priority of any suspected process.

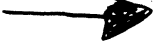

If unrecoverable:

- Force an emergency shutdown.

To force an Emergency Shutdown, follow these steps:

Press the BREAK sequence to enter SCP-CLI.

```

 SCP-CLI> HALT
SCP-CLI> . 

AC0          AC1          AC2          AC3
nnnnnnnnnnn nnnnnnnnnnn nnnnnnnnnnn nnnnnnnnnnn
PC          C          MAP
nnnnnnnnnnn n          ATU

SCP-CLI> RESET
SCP-CLI> START 50

AOS/VS PROCESSING ABORTED
STRIKE "D" FOR AOS/VS DUMP OR "S" FOR AOS/VS SHUTDOWN
OR "R" FOR OPEN FILE REPORT
? D
```

AOS/VS Caused Emergency Shutdown

AOS/VS FATAL ERRORS automatically execute the CORE DUMP procedure:

```
AOS/VS SYSTEM DUMP
LOAD TAPE ON MTB0
STRIKE "D" WHEN READY: D
DONE.
STRIKE "S" FOR AOS/VS SHUTDOWN, OTHER KEY TO HALT.
```

If CORE DUMP routine fails, the system console displays:

```
ERROR MESSAGE
BAD MEMORY DUMP
RESTART MEMORY DUMP?

STRIKE "S" FOR AOS/VS SHUTDOWN, OTHER KEY TO HALT.
? S

File system restart
Now restarting device 24 unit 1
Now restarting device 24 unit 0

Flushing buffers

Open file processing

System shutdown

SCP-CLI>
```

Fixup

- A utility program run to locate and, if needed, to correct errors in disk file structures.
- Must be run when a successful SYSTEM SHUTDOWN is not achieved.
- Dialog stored optionally in script files.
- Should be run periodically on disks to delete ?+.TMP files.
- Runs standalone or from Technical Maintenance Menu.
- Use Verbosity 0 for fastest fix
Verbosity 1 for more information
Verbosities 2,3 for an STR.

AOS/VS Disk Fixer, Rev 7.64.00.00

Verbosity [1] ?

Error logfile for standalone [console] :

Error logfile for standamong [console] :

Should I report closing files and deleting transients [n] ? Y

May I fix it [n] ? Y

Would you like to select any options [n] ? Y

Delete ?+.TMP files [y] ?

Should I cancel queueing on serious errors [n] ? Y

--- REQUEST 1 ---

Specify each disk unit in the LDU

Enter disk unit name : DPF0

Device code [27] ?

Is there another disk unit in the LDU [n] ?

Is disk mirrored [n] ?

If fixing is not needed for this LDU,

Would you like to cancel this request [n] ? Y

Would you like to queue up another request [n] ? Y

--- REQUEST 2 ---

Specify each disk unit in the LDU

Enter disk unit name : DPJ0

Device code [24] ?

Is there another disk unit in the LDU [n] ? N

Is disk mirrored [n] ?

If fixing is not needed for this LDU,

Would you like to cancel this request [n] ? Y

Software Trouble Reports

If there appears to be a problem with any Data General Corporation supplied software, a Software Trouble Report (STR) may be submitted. ANYONE may submit an STR, contract or not.

- Check monthly newsletter for similar problem.
- Check On-Line Information System for any similar problem.
- Call Atlanta Customer Support Center if contracted, to see if a known problem. Call them if an answer is discovered.
- Verify hardware is in good working order.
- Verify software requirements are met.
- Write the STR, mail to Atlanta, and BE VERBOSE.
- Follow release notice STR instructions.

```
LICENSED MATERIAL - PROPERTY OF DATA GENERAL CORPORATION
STR STATUS REPORT FOR AOS/V5 Infos II
AS OF 03-18-86
-----
STR:000120101  ORIG-ID: GALT1034          REV: 4.00
PROB:
INDEXCALC returns incorrect results (e.g.MIN.INITIAL NODE SIZE, NODES, PAGES,
ROOT SIZE (BYTES)).
STAT: Problem is under investigation
-----
STR:000120064  ORIG-ID: GALT1033          REV: 4.00
PROB:
Attempting to run ICREATE with the /B switch from other than the original
user CLI process results in a spurious "**** END OF USABLE INPUT ON BATCH
FILE****" ERROR.
STAT: Problem is under investigation
-----
STR:000120053  ORIG-ID: GALT1032          REV: 4.00
PROB:
When BYE command is issued abd program has open INFOS files, the INFOS
statistic for CLOSES is not updated.
STAT: Problem is under investigation
-----
**** STR:000119863  ORIG-ID: S88557-0          REV: 4.00
PROB:
File open for INPUT SEQUENTIAL gives invalid EOF indication.
STAT: Incident or problem is closed
ANSW:
Fixed in Rev 4.10 of AOS/V5 INFOS II. Patch #19 to the RING4.PR corrects
the problem for Rev 4.00.
-----
**** STR:000031260  ORIG-ID: KALA-089          REV: 4.00
SUGG:
Request for enhancement: to have more control of people who use INFOS.
Want to be able to send Control @infos commands to a listfile.
STAT: Incident or problem is closed
ANSW:
Thank you for your suggestion. The ability to send Control @INFOS commands
to a specified listfile will be available in Rev 4.10 of AOS/V5 INFOS II.
Be sure to check the release notice when available for further details.
-----
**** STR:000031109  ORIG-ID: SCHW JP 86-0005          REV: 4.00
PROB:
The internal file-locking mechanism of INFOSII produces redundant signals which
could be caught by other ?WTSIG's
STAT: Problem is under investigation
-----

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CS-04698
```

Figure 10.2 Sample Page of the Monthly Newsletter

STR Processing

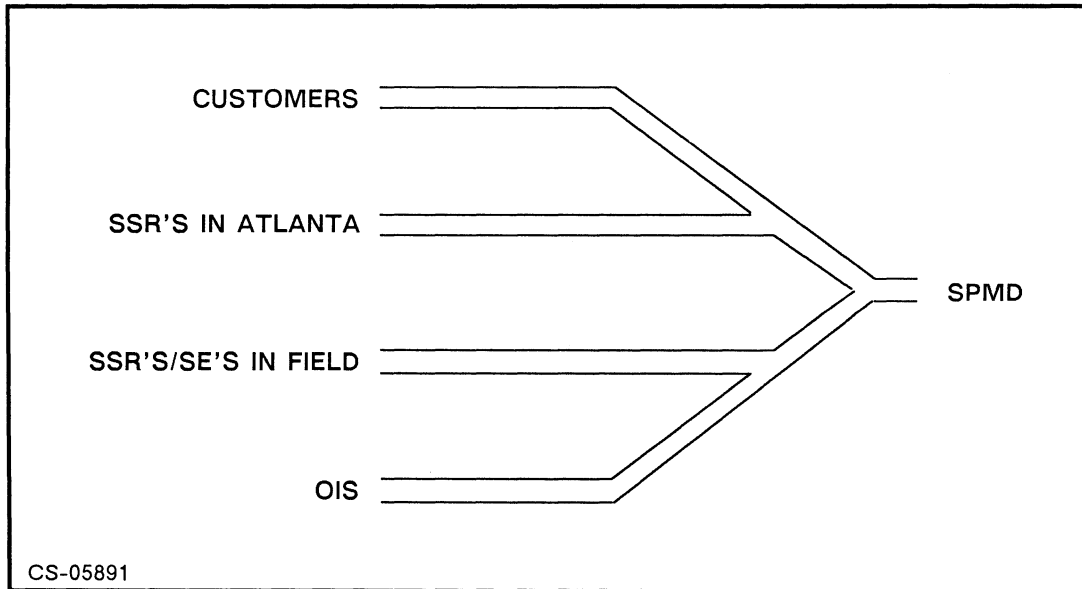


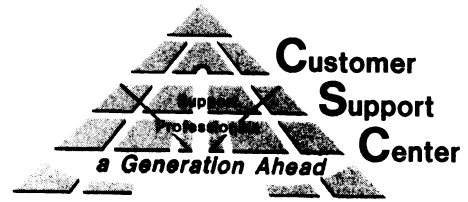
Figure 10.3

- SPMD has 5 days to ANSWER or ESCALATE.
- Acknowledgments sent usually after 2 days.
- Call is made when STR is closed.

Data General Service, Inc.

A Subsidiary of Data General Corporation

1626 Jeurgens Court
Norcross, GA 30093
Telephone (404) 923-0496



June 28, 1988

Joe Cannata
Data General Corporation
7927 Jones Branch Drive
Suite 200
McLean, VA 22102

Dear Mr. Cannata:

This letter acknowledges receipt of your Software Trouble Report (STR). Your STR has been identified as follows:

Originator STR Number: 6411-CANNATA-01

Corporate STR Number: 132736

Problem Summary: "GLOBAL USERS" mailing list contains entries form deleted Profiles/Users.

STR status information may be obtained from the On-Line Information System (OIS), in the Monthly Newsletter, published by Software Subscription Services, or by contacting the STR Co-ordinator in our Software Problem Management Department (SPMD) at 1-800-DG-HELPS. When inquiring about STR status, please have your Corporate STR number available.

An STR answer will be sent to you as soon as the Customer Support Center receives a reply from our Corporate Software Development organization. We appreciate your continued interest and commitment to Data General Services.

Please use the following new address when mailing STR's to the Customer Support Center.

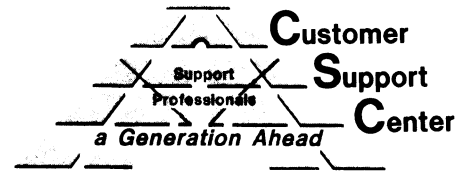
Data General Service, Inc.
Software Problem Management Dept.
1626 Jeurgens Court
Norcross, Ga 30093
Attention: STR Administrator

Department Manager
Software Problem Management

Data General Service, Inc.

A Subsidiary of Data General Corporation

1626 Jeurgens Court
Norcross, GA 30093
Telephone (404) 923-0496



September 1, 1988

Joe Cannata
Data General Corporation
7927 Jones Branch Drive
Suite 200
McLean, VA 22102

RE: STR Number: WEBO-000132736-0
Originator Number: 6411-CANNATA-01

Dear Customer:

Thank you for your interest in Data General's AOS/VS CEO INTEGRATED, model number 30047. Please find enclosed our response to the following trouble report description.

"GLOBAL USERS" mailing list contains entries from deleted Profiles/Users. Unable to delete any of those users from the mailing list.

After careful review of the symptoms reported, our response follows:

In revision 3.02 of CEO, the address resolution of the Global and Local Users mail lists will screen out any users who are deleted or memorialized. Anytime resolution of these lists is requested, the memorialized and deleted bits will be checked. If either is set, the object will be ignored.

Your continuing support of Data General products is greatly appreciated, and we look forward to serving you in the future.

Sincerely,

Data General Corporation

Data General Support Service

Service Personnel

- FE - Handles ON-CALL and PER-CALL hardware services.
- SE - Handles pre-sales and post-sales software installation. An SE also handles "HOW TO" questions.
- SSR - Handles post-sales software problems, questions. SSRs are not "DIAL-A-GURU," but act as a resource.

Hardware Services

ON-CALL SERVICES

Standard service agreement	Multi-terminals deferred
Extended coverage	Critical response services
Enhanced response	Remote assistance program
Fifteen-month service	Resident FE program
Maximum up-time service	Terminal maintenance

PER-CALL SERVICE

On-call services available this way, but response not as timely.

DEPOT REPAIR SERVICES

Centralized product repair, refurbishment, and system testing on Data General products. Centers located nationally and worldwide.

NEGOTIATED AGREEMENTS

Available for larger customers and OEMs. Often involve shared responsibility for maintenance. (Data General/customer)

MULTIYEAR PLUS

Fixed-price package that includes ALL of On-Call Services.

Software Services

SUPPORT PLUS

- Toll-free telephone support
- Remote software support
- On-site assistance
- On-line information service (OIS Bulletin Board)
- Software subscription service (SSS)
- Microcode updates
- Optional adders:
 - Quarterly PM visits
 - Reduced-rate coverage for other systems
 - Additional caller option
 - Telephone PC-based products help line
 - Extended (24 hour) support service for certain products
 - Installation services
 - Educational Services training credits

INITIAL SOFTWARE SERVICE PACKAGES

- 1 year warranty
- 1 year SSS

ON-LINE INFORMATION SERVICE (OIS)

- Dial-up bulletin board available 7 X 24
- Messaging facility
- Access through CompuServe, TELENET, TYMNET, DATAPAC

SOFTWARE SUBSCRIPTION SERVICE (SSS)

- New releases of software and manuals

CONSULTING SERVICES

- Specialized by System Engineering and Educational Services
 - Start-up services
 - Database design
 - Disaster/recovery planning
 - Programming
 - Security audits

SEPAC PERFORMANCE CONSULTING

- MV/Checkup
- Stats-only
- Off-site Performance Analysis Report
- Enhanced On-Site
- Stats Plus On-Site
- Baseline Capacity Analysis
- VSPAC (establish your own performance analysis)

EDUCATIONAL SERVICES

- Scheduled Education Center Lecture Courses and On-sites
- Technical Seminars and Colloquiums
- Computer-Based Training
- TIPS
- At-A-Glance Books

MODULE 11

Performance and Checklists

Objectives

Upon completion of this module, the student should be able to:

1. Cite various procedures to run that may make a minor performance improvement.
2. State housekeeping procedures that should be regularly run on an ECLIPSE MV/Family system.

Zero-Level Indexing

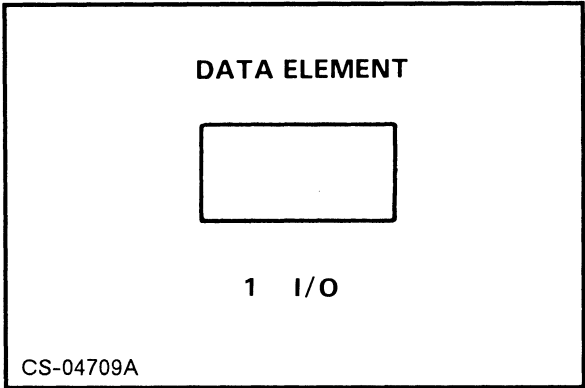


Figure 11.1A Zero-Level Indexing

1-Level Indexing

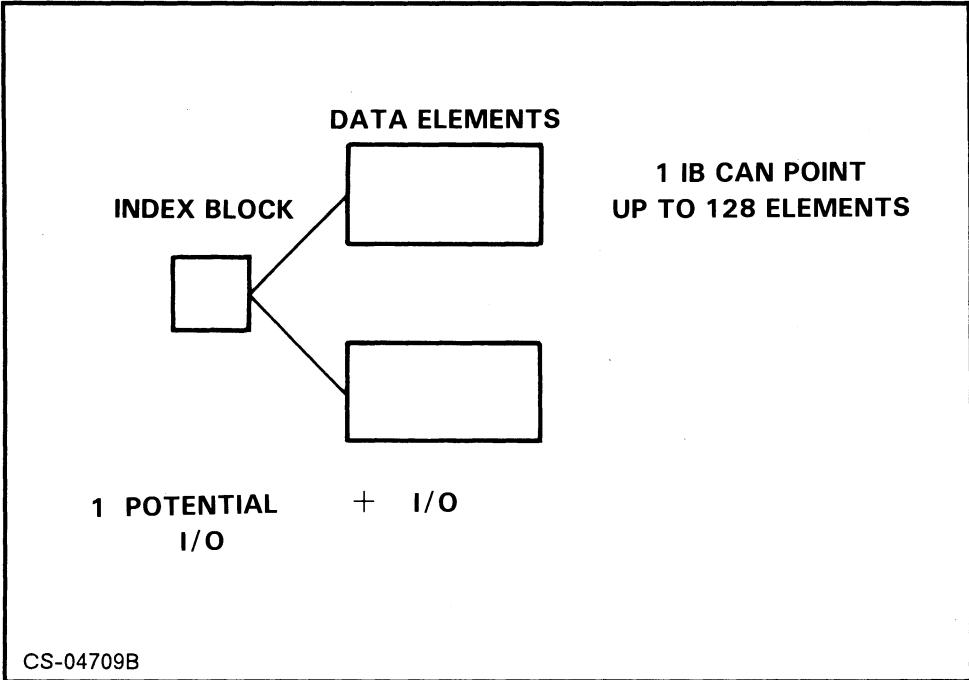


Figure 11.1B One-Level Indexing

2-Level Indexing

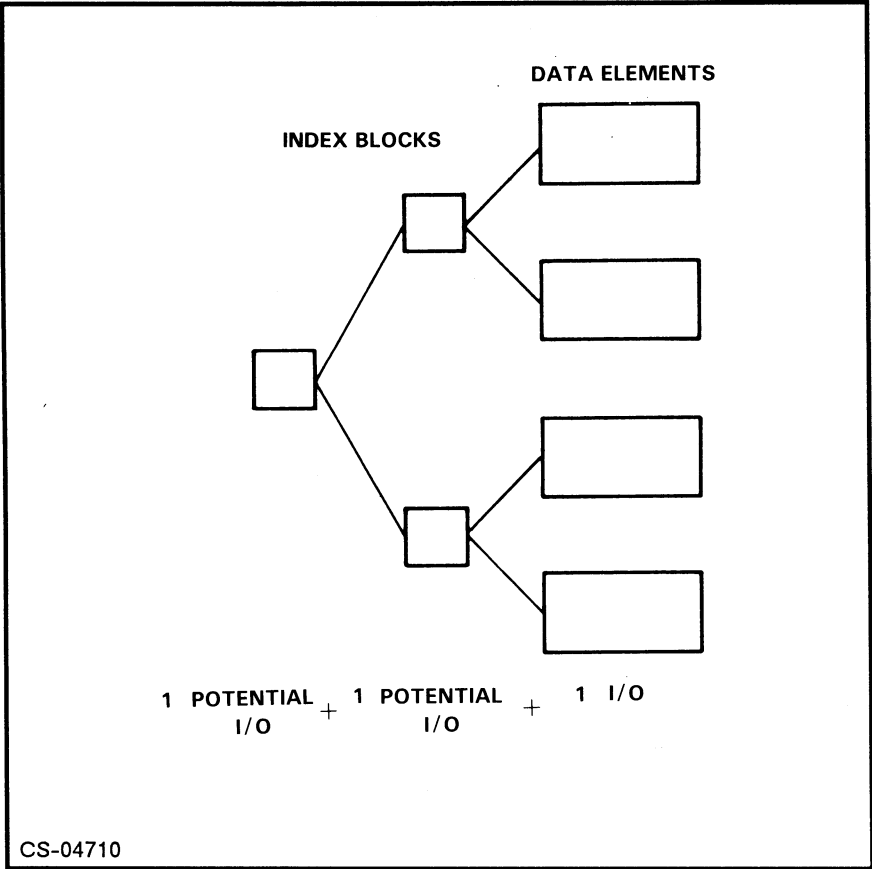


Figure 11.2 Two-Level Indexing

3-Level Indexing

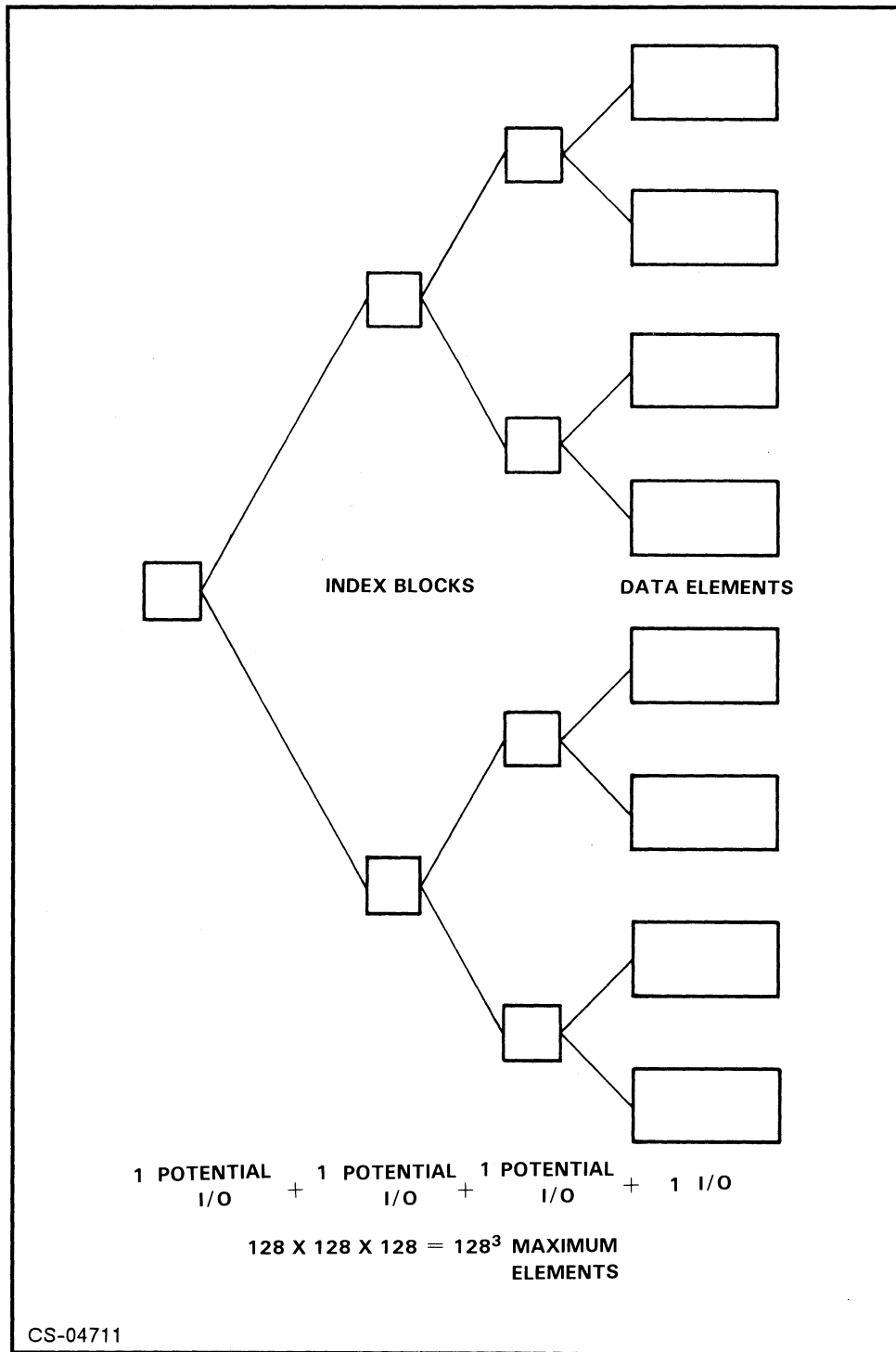


Figure 11.3 Three-Level Indexing

Maximum File Sizes in Bytes

Element Size	0	1	2	3
1	512	65,536	8,388,608	1,073,741,824
4	2,048	262,144	33,554,432	4,294,967,296
8	4,096	524,288	67,108,864	
16	8,192	1,048,576	134,217,728	
32	16,384	2,097,152	268,435,456	
64	32,768	4,194,304	536,870,812	
128	65,536	8,388,608	1,073,741,824	
256	131,072	16,777,216	2,147,483,648	
512	262,144	33,554,432	4,294,967,296	
1024	524,288	67,108,864		
2048	1,048,576	134,217,728		
4096	2,097,152	268,435,536		
8192	4,194,304	536,870,912		
16384	8,388,608	1,073,741,824		
32768	16,777,216	2,147,438,648		
65532	33,552,384	4,294,705,152		

Element Size by File Size

File Size	Element Size	
	0 Levels	1 Level
1 MB	2048	16
2 MB	4096	32
3 MB	5120	48
4 MB	8192	64
5 MB	9216	80
6 MB	10240	96
7 MB	14336	112
8 MB	16384	128
9 MB	18432	144
10 MB	20480	160
20 MB	40960	320
30 MB	61440	480
40 MB	---	640
50 MB	---	800
60 MB	---	960
70 MB	---	1120
80 MB	---	1280
90 MB	---	1440
100 MB	---	1600
200 MB	---	3200
300 MB	---	4800
400 MB	---	6400
500 MB	---	8000
600 MB	---	9600
700 MB	---	11200
800 MB	---	12800
900 MB	---	14400
1 GB	---	16000

Hashframes in AOS/VS

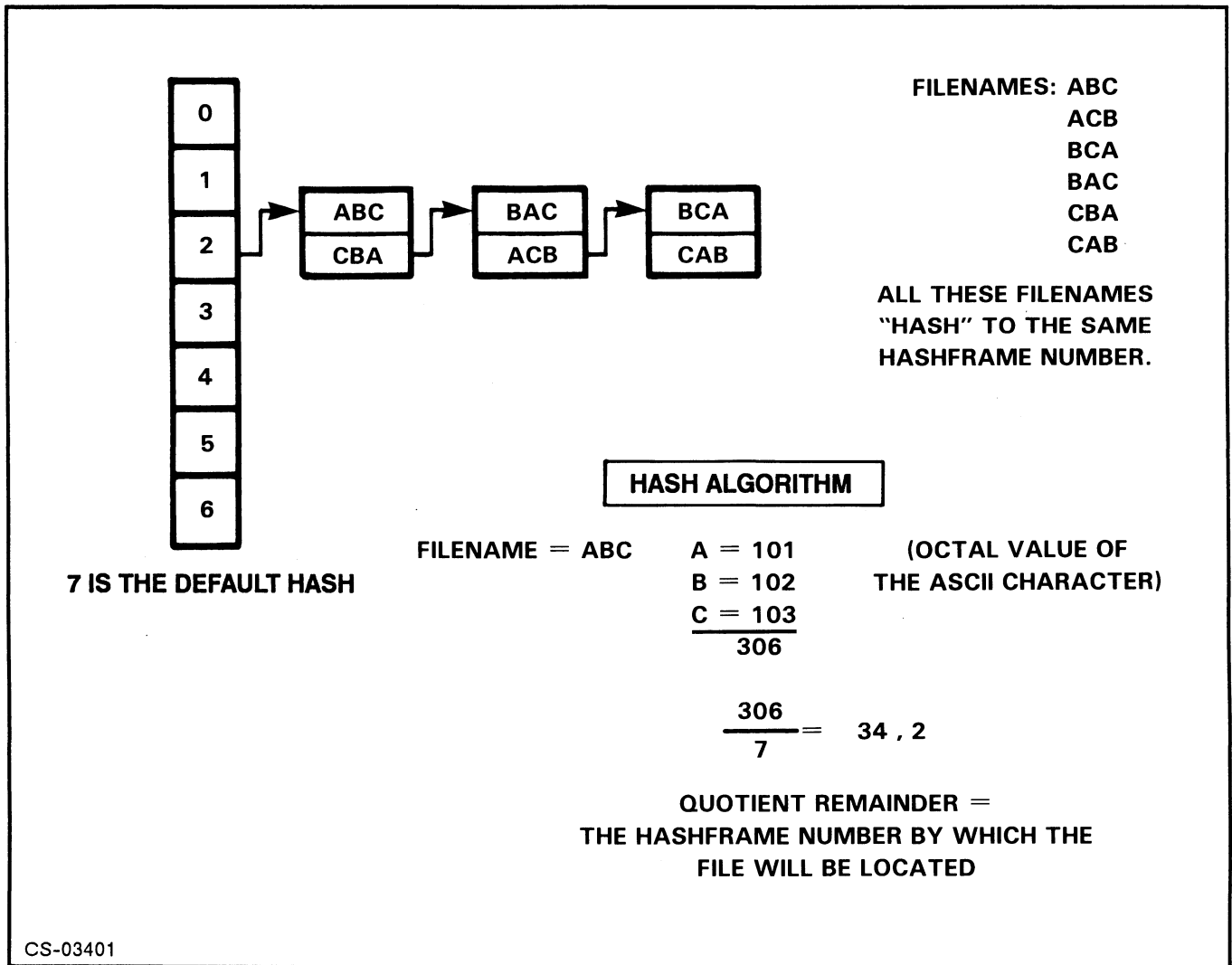


Figure 11.4 Directory Entry Hashframesize 7

Rule of thumb on hashframes:

$$\frac{\# \text{ FILES IN DIRECTORY}}{20} \quad (\text{rounded up})$$

Regular Procedures to Follow

Frequent Procedures

- Consult your system logs and run REPORT.
- CEO users should run JANITOR.

Occasional Procedures

- If worthwhile, offload and reformat your disk, then download. *RUN DISK 0*
- Do a full backup and keep offsite. *✓*
- Print out a file listing and archive unused files. *✓*
- Print out a listing of all profiles and compare to the previous one. *-?*
- Print a list of the directory structure. *KNOW*
- Print a list of all ACLs. *ACL OWNERSHIP OF DIR*

Security Considerations

- Change the OP password. *NO PRIVILEGE*
- Change the LOCK_CLI password. *CHANGE 32 BIT LOCK - CLI*
- Change or have users change passwords.
- Delete temporary profiles. *DEL TEMPS*
- Read the log reports.
- Check for unrecorded modifications to profiles. *CHECK*
- Encrypt passwords. *NO*

Troubleshooting Performance

Performance Bottlenecks

- DISK YES
- CPU
- MEMORY
- IAC

Performance Checklist

- Keep searchlists short, with important directories up front. *SMALL SEARCH LIST*
- Keep filenames 12 characters or less.
- Tailor element sizes to keep index levels no greater than 1.
- Set hashframe sizes properly.
- Make program files contiguous, including system .PRs, like CEO and INFOS_II.
- Delete extra files like .EDs, .BUs, 093+, +.<TMP.BRK,MDM> 085+ *073 DOCUMENT FILES REMOVE*
- Set your cache buffers as large as you can. *2048*
- Tune the INPUT and OUTPUT buffer sizes on your IACs. *VS GEN LOWER INPUT RAISE OUT*
- Run monitoring utilities like PED, DISCO, and HISTO.
- Any file with an ACL of +, priv will save an I/O. *REVIEW*
- Avoid single-character I/O programs.
- Compile with the /OPT=n switch where possible.

MODULE 12

Lab Exercises

There are more labs in this section than there is time for under normal class conditions. Your instructor will choose which labs are to be done during the lab sessions.

1. VSGEN Lab	12-2
2. EXEC Control Lab	12-4
3. PREDITOR Lab	12-12
4. UP.CLI Macro Lab	12-15
5. ACL Review Lab	12-17
6. System Design Exercise	12-21
7. PED/DISCO Lab	12-25
8. LOCK_CLI Password Lab	12-26
9. FIXUP Script Lab	12-27
10. System Build Lab	12-28

Optional Review Questions

Module 2	12-30
Module 3	12-33
Module 4	12-36
Module 6	12-39
Module 7	12-40

VSGEN Lab

Generating a Tailored AOS/VS Operating System

In this lab, you will generate an AOS/VS system using VSGEN, based on a hardware list provided. To start the lab type:

```
)X VSGEN
```

Using the hardware provided below and the worksheet on the next page, generate your custom system. Remember, you VSGEN CONTROLLERS only.

HARDWARE LIST

- 1 - MV/20000 with 48 Mb of memory
- 3 - DPJ disk controllers
- 3 - 592 Mb disks
- 2 - 862 Mb disks
- 3 - 1600/6250 tape drives
- 1 - MTD tape controller
- 2 - IAC-16's
- 1 - IAC-8
- 1 - 1200 LPM printer
- 1 - 300 LPM printer
- 40 - D462 terminals
- 2 - Line printer controllers
- 1 - Battery backup unit
- 1 - D216 OP console
- 1 - Laser printer

Edit the default VSGEN spec file to reflect your configuration.

VSGEN hardware items one at a time, saving IACs for last.

(V)erify that your configuration is correct.

(N)ame your system.

(B)uild your system.

(Q)uit the program.

)QPRINT your_system.CSF and review.

VSGEN Lab Worksheet

MACHINE NAME	_____	
DISK CONTROLLERS	_____	_____
TAPE CONTROLLERS	_____	
PRINTER CONTROLLERS	_____	_____
BBU	YES	or NO

For the first IAC16, gen all lines 0 to 15 as type "CRT6." Take all defaults for characteristic words and the line initialization word.

For the second IAC16, gen lines 0 to 14 as type "CRT6" using all defaults, gen line 15 for your laser printer.

For the first IAC8, gen lines 0 to 4 appropriately for use with modems. Gen remaining lines for use with console type "CRT3."

IACs

Gen in your IAC16s first and your IAC8 last; fill in the following information:

First IAC16:

BASE LINE NUMBER: _____

TYPE (16 or 8) _____

Second IAC16:

BASE LINE NUMBER: _____

TYPE (16 or 8) _____

First IAC8:

BASE LINE NUMBER _____

TYPE (16 or 8) _____

EXEC Control Lab

Students will work in groups at adjacent consoles for this lab, so please form a group!

In Part 1, each student logs on, creates a queue, and places some requests in it. Files named `TEXTn` (where `n` is a digit) are provided in `:S219VS:FILES` for this purpose; they can be referenced through the searchlist.

Next, the student queues are connected to the line printer. Although working independently during this part, students should consult with each other to maximize their understanding of the lab.

In Part 2, one student in each group logs off and disables his/her console so that it can be used as a spooled device.

Throughout this lab, you will be required to enter EXEC commands. To accomplish this, the instructor may provide a limited number of terminals that will be logged on under the OP username. Remember, only a username of EXEC's parent (usually OP) is allowed to issue EXEC commands.

Use the `OPON.CLI` macro to become OP, if OP consoles not provided.

DO NOT change or alter system queues!

DO NOT pause LPB or batch streams!

Use either:

`CE.CLI`
`CX.CLI`

EXEC Control Lab

Part 1

- There is a HELP facility provided for these @EXEC COMMANDS. Try the CLI macro XHELP. You should be shown a list of all the CONTROL @EXEC possibilities.
- Use XHELP CREATE to learn how to write the command to create a queue. Create a queue of type PRINT, giving it any name you want. Wherever you see `your_queue` in this lab, substitute the name you have given your queue. Verify that your new queue exists by entering:

`QDISPLAY/QUEUE=your_queue`

- Before any users can enter requests into this new queue, OP must open it. Use XHELP OPEN to learn how to write the command and then open your queue, and remember that you must issue the EXEC COMMAND from OP.

STOP

STOP

CLOSE

REMOVE

DFL

EXEC Control Lab

- Place three print requests into your queue by entering:

)QPRINT/QUEUE=your_queue/DEST=your_initials TEXT<1,5,6>

What sequence numbers were assigned to them? 47, 48, 49

What QPRIORITY was assigned to them? 127

- Users can choose the QPRIORITY of their requests, rather than accepting the default. The highest QPRIORITY is 0, the lowest QPRIORITY is 255. To place two requests into your queue with different QPRIORITYS, enter:

)QPRINT/QUEUE=your_queue/DEST=your_initials/QPRIORITY=100 TEXT2 52
)QPRINT/QUEUE=your_queue/DEST=your_initials/QPRIORITY=200 TEXT3 55

- Find out the names of your partners' queues. Place a request into one of your partner's queues. Enter:

partner's queue
)QPRINT/QUEUE=partner's_queue/DEST=your_initials TEXT4

- Get a display of the entries in your queue by entering:

)QDISPLAY/QUEUE=your_queue

- Select two of the sequence numbers in your queue. Place a user hold on one of them by entering:

)QHOLD seq num 47

Cancel the other request by entering:

)QCANCEL seq num 48

- Add one more request to your queue by entering:

)QPRINT/QUEUE=your_queue/NOTIFY/DEST=your_initials TEXT1 67

- Get another QDISPLAY of your queue and observe the results of the last several commands. Observe that the requests are listed in the order in which they will be processed.

EXEC Control Lab

- Nothing has been printed yet; you let some requests into your queue with the CREATE and OPEN commands, but none out the other end. To do this you must associate your queue to an output device (console, printer, plotter, or paper tape punch).
- Use XHELP, START to learn how to write the command to connect your queue to the line printer (@LPB). START your queue @LPB.
- The operator has final control over the jobs in the queues. Get a summary of all the queues by entering:

QDISPLAY/S

- Select one of your classmate's queues and get a QDISPLAY of it. Choose two sequence numbers that do not have the NOTIFY flag. Place an operator hold on one; enter:

CX HOLD seq num

Cancel the other request by entering:

CX CANCEL seq num

- Get another QDISPLAY of this classmate's queue and observe the effects of your operator commands.

EXEC Control Lab

- After you have been notified that your own last request has been printed, stop your queue. Enter:

```
)CX STOP your_queue
```

- Examine your printer output. Notice the output produced by your canceled requests.
- Place some requests requiring special forms into your queue:

```
)QPRINT/QUEUE=your_queue/FORMS=LABEL/DEST=your_initials &  
TEXT<1,2,3>
```

- Place some ordinary requests into your queue:

```
)QPRINT/QUEUE=your_queue/DEST=your_initials TEXT<4,5,6>
```

- Place some low QPRIORITY requests into your queue:

```
)QPRINT/QUEUE=your_queue/QPRI=255/DEST=your_initials TEXT<1,3,6>
```

- To get a verbose description of your queue, enter:

```
)QDISPLAY/QUEUE=your_queue/V
```

Note that the /V allows you to see the date and time of the request and whether special forms are required.

EXEC Control Lab

Part 2

- So far, you have had multiple queues connected to one device. Now, you will also have multiple devices connected to queue(s). When all students in your group have completed Part 1, prepare a console in your group for use as a spooled device.
- Use XHELP DISABLE to learn how to get EXEC to release the selected console. You can learn the consolename by entering the WHO command at the selected console. From any OP process, issue the EXEC command to disable the selected console. Log off the student at the selected console. For the rest of the lab, it will be convenient to leave an OP process running at one of the remaining consoles in your group, and any student logged on at the other.
- From your OP process, use XHELP to learn about the START command. Start one of your group's queues at your spooling console.

EXEC Control Lab

- Start your group's remaining queues at your spooling console.
- Use XHELP to learn about QPRIORITY. Set your spooling console to process only requests with QPRIORITIES in the range 251 through 255.

Set @LPB to process only requests with QPRIORITIES in the range 0 to 250.

- Use XHELP to learn about SPOOLSTATUS and STATUS. Use these commands to find out all you can about your group's queues and spooling console.
 - Why haven't any of your enqueued files been printed on your spooling console yet?
-

- Start all of your group's queues @LPB.
 - Continue your spooling console.
 - Observe some of your requests appearing on your spooling console while others appear at the line printer.
 - What characteristic of each request determines which device will process it?
-

EXEC Control Lab

- Set the QPRIORITY of your spooling console to 0 through 255.
 - What requests still cannot be processed?
-

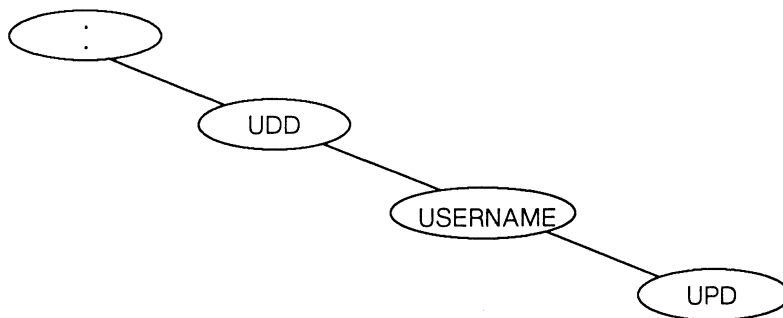
Your LABEL requests are waiting for OP to start a device with special forms!

- Using XHELP, determine and issue the command(s) needed to get your spooling console to process LABEL requests. You should see your output.
- Please delete all queues that you have created.
- You cannot delete a queue with requests in it, so it must be stopped, closed, and purged.
- Re-enable the console used as a spooling device.

PREDITOR Lab

The purpose of this lab is to familiarize you with the user profile maintenance utility, PREDITOR. Since this utility requires the SUPERUSER privilege, we will be running a patched version of PREDITOR we call CREDITOR.

CREDITOR will look and act just like PREDITOR, since it uses the same code. The only difference will be that when you run CREDITOR, in your :UDD:username directory will be a mini-UPD directory. You can DIR into this directory to examine the profiles you have created with CREDITOR.



- To get CREDITOR started, type in:

`)X CREDITOR`

- Get a list of the valid PREDITOR commands by typing:

Command: `H` (for Help)

- Now we're going to create our first profile. Issue the command to create a profile, and build one with your name as the username. Choose any privileges you need. Do not encrypt the password.
 - Supposing you need to change the INITIAL IPC FILE to be :UTIL:MACROS:STARTUP.CLI. What command lets you make changes?
-

- Go ahead and make the change to your profile.

PREDITOR Lab

- Since you do not want to lead alone, you need to make a profile for the alternate manager. You could go through the whole process of building a new profile, but all of the alternate manager's privileges match yours. What command will let you make another profile based on yours?
-

- Enter the command from the answer blank when prompted. Enter your username when prompted. Watch the screen scroll your profile by. Now, your profile values are the defaults.
- Type the following command to build the new profile:

Command: C

- Enter the new username and NEW LINE all the way through the questions.
- Five temporary data entry clerks have been hired. You will need to create profiles for them with the names:

DE.GAIL DE.SAM DE.PHIL DE.FRED DE.CHRISTIE

- Encrypt the password on all. Assign a maximum of 2 sons for each user. Set the initial program to :PROGRAMS:MAINMENU.PR. Do not assign the batch or modem privileges. Set their maximum priority to 127, and disk quota to 5000 blocks. Default to the other questions.

Hint: Rather than enter answers for 5 profiles, set up DE.GAIL first, and learn how the QUESTION and USE commands can help speed the process. QUESTION will turn on/off profile questions, so you only need to see those questions which will be different for each user, once you set a "master" as a default, by the USE command.

- Leave PREDITOR. Now type:

)DIR UPD (NOT :UPD!!!)

- Do a filestatus and you should see your profile, the alternate manager's profile, and the 5 data entry profiles. We will try to see the password with the DISPLAY program. Type in:

)X DISPLAY your profile

PREDITOR Lab

- Now that you saw your password, let's look at an encrypted one.

```
)X DISPLAY DE.FRED
```

- You will see that the password cannot be determined by looking at it, making it more secure. Return to your initial working directory:

```
)DIR/I
```

- Execute CREDITOR again. It is time to delete the profiles for the temporary data entry clerks. Issue the DELETE command. When prompted for a username, enter:

```
Username: DE.user
```

Now go ahead and repeat this until all of the user profiles are gone.

This will delete all profiles beginning with "DE." Templates can be useful in deleting. Exit CREDITOR.

- We will now run CREDITOR to get a hard copy of the remaining profiles. Type this in:

```
)X CREDITOR/L=PROFILE.LIST
```

- You will be back in CREDITOR. Issue the following commands:

```
Command: L  
Username: +
```

- Leave CREDITOR and QPRINT the file PROFILE.LIST. You will now have a hard copy of the profiles you created.
- QPRINT the MASS.PROFILE.CLI and MASS.PROFILE1.CLI macros in the :S219VS:MACROS directory. These will be useful if you need to build large numbers of profiles at once.

UP.CLI Macro Lab

Using the default UP.CLI macro supplied with the system, customize it to include the configuration listed below.

To start this lab:

```
)DIR :S219VS:FILES
)MOV/V/NA CL [!DIR/I] UP.CLI
)DIR/I
)X SED UP.CLI
```

@CON2-@CON17	- User Consoles	} All users get 3 tries and then console must be disabled
@CON22-@CON25	- User Consoles	
@CON28-@CON32	- User Consoles	
@LPB	- 300 LPM Printer	
@LPB1	- 1200 LPM Printer	
@CON40	- Desktop Laser Printer	
@DPJ1	- Disk Containing :UDD	
@DPJ2	- Disk Containing :CEO_FILES	

INFOS_UP	- An UP Macro to start INFOS
CEO_UP	- A custom-written UP Macro to start CEO

(INFOS must come up before CEO, and takes time to come up.)

LG_JOBS	- a print queue
SM_JOBS	- a print queue
LPT	- main system print queue
CEO_Q	- print queue for CEO users
BATCH_OUTPUT	- system batch output queue
BATCH_LIST	- system batch list queue

- ASSUME the print queues have already been created and opened.
- Set up 2 batch streams.
- Set the default SEARCHLIST for the users to be:
:UTIL, :MACROS, :, :UTIL:CEO_DIR, :INFOS
- Execute LOCK_CLI and set the PROMPT for the PID running LOCK_CLI to be TIME.
- When you think you are finished, QPRINT UP.CLI and review it with the instructor.
You will not be able to test it.
- Use the diagram on the next page to help layout print queues and devices.

LPT

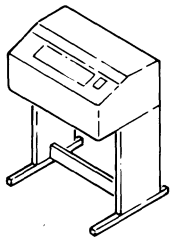
BATCH-
OUTPUT

BATCH-
LIST

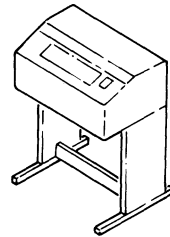
LG-JOBS

SM-JOBS

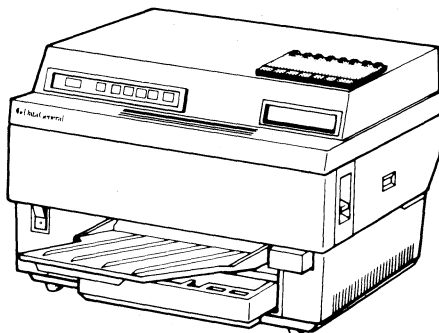
CEO-Q



**@LPB
300 LPM**



**@LPB1
1200 LPM**



**@CON40
LASER PRINTER**

CS-05892

Figure 12.1

Access Control List Lab

ACL Rules

Access Types	Non-Directory Files	Directory Files
EXECUTE	Execute .pr files; read file's PATHNAME, PERMANENCE, and FILESTATUS info	Reference directory; resolve links
READ	Examine file contents/UDA; read file's PATHNAME, PERM, and FILESTATUS info	Read FILESTATUS, ACL and PERMANENCE on each file; resolve links
APPEND	Read file's PERMANENCE, PATHNAME, and FILESTATUS info	Create new files; INITIALIZE an LDU in the directory
WRITE	Modify file contents or create UDA; read FILESTATUS, PERMANENCE, PATHNAME info	Use CREATE, DELETE, INIT & RENAME; change ACLs & PERMANENCE of files
OWNER	Use ACL, DELETE, RENAME, PATHNAME, FILESTATUS, and PERMANENCE; Read/write UDA	Use ACL, RENAME, and DELETE on directory

Directory file types = DIR, CPD, and LDU

Non-directory file types = the other 256 types

Access Control List Lab

Assume that you are logged on as username S219VS. Using the directory structure below, answer the questions that follow with **yes** or **no**.

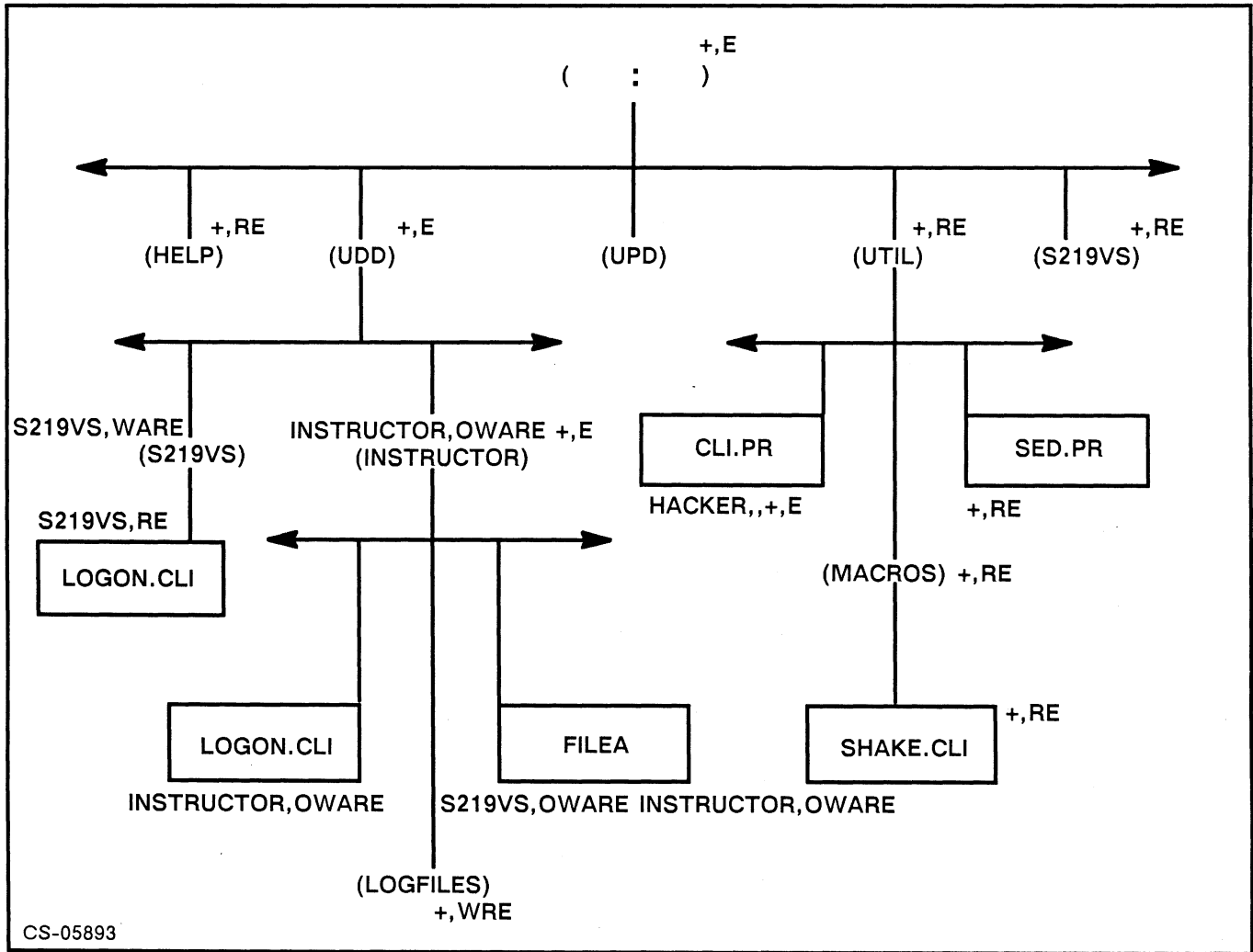


Figure 12.2

Access Control List Lab

1. Could you use the FILESTATUS command on these directories?

: _____ :HELP _____ :UDD _____ :UDD:INSTRUCTOR:LOGFILES _____

2. Could you create files in these directories?

:UDD:S219VS _____ :UTIL _____ :UDD:INSTRUCTOR _____

3. Could you DIR to these directories?

:UDD _____ :UTIL _____ :UDD:INSTRUCTOR _____ :UPD _____

4. Could you type the contents of these files?

FILEA _____ CLI.PR _____ :HELP _____

5. Could you execute these files?

:UTIL:SED.PR _____ :UTIL:CLI.PR _____ :UPD _____

6. Could you read any file in :UPD? _____

7. Could you change the ACLs of these files?

FILEA _____ CLI.PR _____ S219VS _____

8. Could you delete FILEA? _____

9. Could you set listfiles/logfiles in these directories?

:UDD:INSTRUCTOR:LOGFILES _____ :UTIL _____ :UDD:S219VS _____

10. Could you move copies of these files to your directory?

:UDD:INSTRUCTOR:LOGON.CLI _____ :UDD:INSTRUCTOR:FILEA _____

:UTIL:SED.PR _____ :UTIL:MACROS:SHAKE.CLI _____

Access Control List Review ACL Caveats

- Give the most specific username first.
- Always double check spelling of usernames!
- Where possible, use the universal ACL.
- Give at least EXECUTE access to all directories in path to specific file.
- Generally, always give READ permissions when you give WRITE permissions.

SASA Inc. – A Delaware Corporation Share and Share Alike Incorporated Timesharing and Computing Services

System Design Exercise

This exercise is designed to bring together all that has been discussed so far this week. You will be put into groups first, then you will get together as a class to review your designs. Free thinking and brainstorming is encouraged.

There is no right answer to this exercise. There are however, several approaches that will work well, some that will not. Your instructor and classmates will determine, at least on paper, whether your design will be a success.

Don't get mired in the details, and most of all HAVE FUN!

SASA Inc.

System Design Exercise

SASA is a newly formed timesharing company that will be providing data processing services both on-line and batch. In addition to the regular applications offered, SASA is prepared to write custom programs for each customer.

On-Line Accounting Services

- Accounts Receivable (AR)
- Accounts Payable (AP)
- General Ledger (GL)
- Payroll (PAY)
- Data entry is done at the customer site. Forms and reports are printed at SASA.
- Special “ad hoc” reports are run for a fee.

Batch Payroll Services

- Payroll
 - Data entry is done by SASA staff
 - Weekly paychecks are on the customer’s own check forms

Financial Planning (FP)

- Weekly extracts of customer databases using PRESENT and DG/INGRES
- CEO Decision Base for spreadsheets and data tables
- TRENDVIEW and CEO Charting for graphics

Office Automation (CEO)

- Required platform for Financial Planning customers
- Word processing and electronic mail only

Games (G)

- Games are entertaining and a real profit-maker \$\$

SASA Inc.

System Design Exercise

SASA Customers

Customer Name	Services Chosen	Number of Terminals
Ajax Company	AR, AP, GL, FP, CEO, PAY, G	5
Baker Chemicals	FP, PAY, G	3
Delta Limited	AR, AP, GL, G	4
Failsafe Inc.	CEO, PAY	7
Gentech Pty.	AP, GL, FP, PAY, G	4
King Foods Inc.	AR, PAY, G	2
Lovem Cosmetics	AR, AP, GL, CEO, G	4
Ribbon Machinery	AR, AP, GL, FP, PAY	8
Whoopie Novelty Ltd.	AP, GL, PAY, CEO, G	5
Zebra Zipper Co.	AR, AP, GL, CEO, G	5

- 20 Batch Payroll Customers

SASA HARDWARE

- 1 - MV/40000 with 96Mb of main memory
- 3 - 500Mb R.A.M.S. Disks
- 2 - 592Mb Argus Disks
- 2 - DPJ Controllers
- 2 - 1600/6250 Tape Drives
- 6 - IAC-16's
- 2 - IAC-8's
- 5 - 2400 BPS modems
- 50 - D470C color CRT's
- 50 - D462 terminals
- 2 - 600 LPM printers
- 2 - 1200 LPM printers
- 2 - 26 PPM laser printers
- 1 - 120 Port Mux box

SASA SYSTEM SOFTWARE FROM DATA GENERAL

- | | |
|-------------------|--|
| AOS/VS | General use |
| INFOS II | Database management and CEO |
| DG/SQL | Relational database management |
| DG/INGRES | DG/SQL Queries and updates |
| PRESENT | All purpose reporting package |
| SORT/MERGE | File handling and reporting |
| COBOL, C | Application and system development |
| TRENDVIEW | Graphics for charts |
| CEO | Office Automation |
| CEO Decision Base | Spreadsheet, data tables, and charting |

SASA Inc.

System Design Exercise

SASA offers non-stop data entry and uptime 7:00 AM – 7:00 PM Sunday through Saturday. After 7 PM is when batch payroll and backups need to be run.

SASA Staff

5 Programmer/Analysts
1 Systems/Analyst
1 Programming Manager
6 Operators
2 Lead Operators
5 Data Entry Clerks
1 Secretary
YOU, the System Manager

Remember, SASA makes money by charging for connect time and CPU time. Downtime means lost revenue. You are also legally responsible for the security and integrity of the data. Your mission, since you have no choice but to accept it, is to run a profitable organization.

These are the goals of the design, and please do in order:

1. Plan a directory structure for NON-SYSTEM directories only, and diagram the initial disk loading.
2. Plan a secure username scheme.
3. Set up a basic ACL structure.
4. Indicate which profile privileges you will assign above the defaults.
5. Lay out the EXEC queues, and draw a queue/device diagram.

PED/DISCO Lab

This lab is designed to give you familiarity with PED and DISCO.

Part I. DISCO

Execute DISCO, and experiment with some of the settings, and alternate between screens. Spend about 5 minutes.

Part II. PED

Run PED first with the default display and observe. Then press the A key and note the differences. Use the minpid command keys to slide the window up and down. Spend about 5 minutes.

Press the M key. This brings up the PED menu. Change some of the default switches to view such things as physical page faults, PID size, superuser/superprocess/system manager privileges, the time slice exponent and the PNQF of some of the processes. Spend about 5 minutes on this section.

Part III. Search and Identify

The instructor will have you get back to CLI. Then, he/she will PROC a job that will be page faulting at a phenomenal rate. Your task will be to identify the PID number and username of the job. You will only be given 2 minutes to do so.

PID NUMBER _____

USERNAME _____

LOCK_CLI Lab

In this lab you will get a chance to experiment with the standard LOCK_CLI program that is supplied along with AOS/VS. You will need the directions for modifying the LOCK_CLI password, which can be found in *How to Generate and Run AOS/VS*, or use the CHG_PASSWD.CLI macro. You may print a copy of the macro from :S219VS:MACROS.

- Make your working directory :S219VS:FILES.
- Move to your initial working directory copies of LOCK_CLI.PR, LOCK_CLI.OL, and LOCK_CLI.ST.
- Now DIR/I and X LOCK_CLI. Things will appear normal until you attempt to do something that LOCK_CLI will not allow in the locked state. For example, try to execute another program or even terminate (BYE). You will see that you are really locked into a program with very limited capabilities.
- To get out of LOCK_CLI you are going to have to unlock it first. The password is the standard one, PASSWORD. So enter the command UNLOCK and the PASSWORD, which will not be echoed. You will get no indication whether you were correct or not, so try something you could not do before, and be very careful that you spell PASSWORD correctly. (Note: If you misspell it, you cannot use the DEL or ^U characters to fix things up as they are passed the same as any other characters.) If you cannot unlock it and do a successful BYE ask your instructor for help.

Using FED:

- Now that you have seen what using LOCK_CLI is like, you might want to change the password. (It is common knowledge that the standard password is PASSWORD.) The password is stored in the program code and you do not have the source available to edit (with a standard text editor like SED) so you are going to have to directly edit the LOCK_CLI.PR file. Because the values in this file correspond to machine instructions and not text, you cannot use a text editor on it. However, you can edit any file with the disk file editor, FED.
- First you are going to have to change the ACL on LOCK_CLI.PR so that you can edit it. Now execute, or X FED, as described in the *How to Generate and Run AOS/VS* manual. Carefully follow the instructions to modify the locations starting at the symbol PASSW/ to the password of your choice.
- Execute LOCK_CLI again and verify that your new password is now required to unlock it. At your own installation you might want to frequently modify LOCK_CLI's password to avoid compromising it.

FIXUP Script Lab

The purpose of this lab is to familiarize you with the script capability of FIXUP. You only need answer FIXUP questions once, then you may use the script file on all successive runs of FIXUP.

- Type the following command line:

```
)X FIXUP/BUILD=SCRIPT1
```

- Answer the **Verbosity [1] ?** question by entering a zero for the verbosity level.
- Answer the rest of the questions any way you like.
- QPRINT the file specified in the /BUILD= and review.

- Now type in the following command line:

```
)X FIXUP/BUILD=SCRIPT2
```

- Take the default this time on the verbosity question, and note the difference in the dialogue. Fill in this script a little different than the last one.
- QPRINT the new script and review as well.

S219/VS AOS/VS System Manager

System Build Lab

Your instructor will provide you with a list of hardware that has been installed in a system for your use. You will work in groups for this lab. Your main objective is to get AOS/VS running on the system. Write down any notes or questions that you may have. Be sure to read the release notice before starting. The following steps should help you through the lab.

1. Power up the system and boot the SCP Operating System from the microcode tape provided.
2. Format the disk(s). Be sure to run at least one pattern per disk. This can take some time, but is important since there may be some bad blocks on the disk. In a real situation, you would want to run at least three patterns and, in fact, should run all five.
3. Install AOS/VS on the master disk.
4. Boot the starter system and perform an initial load.
5. After loading all files from the release tape, put the microcode tape on the tape drive and load file 1 from that tape.
6. Run VSGEN to configure your system for the hardware that you have. Remember to check your searchlist so that you can find MASM.PR and LINK.PR.
7. Install any updates that may have come with your release, applying all patches.
8. Bring down the starter system and test your tailored system. Make any changes necessary if your system does not come up.
9. Execute PREDITOR and create an OP profile. Give OP any privileges you want, it's your system.
10. Since you don't have any other software to load, you will just PROC EXEC from the master console with the process command so that you can test your printer(s) and consoles. Set your searchlist to include :UTIL and :.

```
PROC/DEF/DIR=@/NAME=EXEC, EXEC
```

11. Issue the EXEC commands necessary to start your printer(s) and enable the consoles. Remember, you will need to create a queue called LPT.
12. QPRINT your system.CSF file to test the printer(s).

S219/VS - AOS/VS System Manager

Module 2 Review

ECLIPSE MV/Family Architecture

1. Device controllers for line printers, tape drives, disk drives are connected to:
 - a. IOC
 - b. ISC
 - c. SCP
 - d. ATU

2. Which of the following does not have a separate SCP?
 - a. MV/4000
 - b. MV/8000II
 - c. MV/15000
 - d. MV/20000

3. Intelligent Asynchronous Controllers are used to connect modems, terminals, and letter quality printers to the system.
 - a. True
 - b. False

4. An ISC is used to connect computers and other synchronous devices to laser printers.
 - a. True
 - b. False

5. When the processor is powered up, the SCP is in:
 - a. TTY Mode
 - b. Process Mode
 - c. Command Mode
 - d. Cache Mode

6. It is usually a good idea to “write protect” the disk before running any hardware diagnostics on the system.
 - a. True
 - b. False
7. SCP-CLI commands are always typed in uppercase.
 - a. True
 - b. False
8. SCP Error Log can be shut off since AOS/VS does error logging for us.
 - a. True
 - b. False
9. When AOS/VS has had a normal shut down, which prompt appears at the master console?
 - a. *
 - b.)
 - c. SCP-CLI>
 - d. SCP-ERR>
10. Device codes like 17, 24, and 27 are just random numbers that our field engineer picked for our system.
 - a. True
 - b. False
11. The ATU is used for translating ASCII numbers to characters when we want to display information on the master console.
 - a. True
 - b. False
12. The ____ is used to load microcode when we power up the processor.
 - a. SCP
 - b. DRP
 - c. LPB
 - d. MTU

13. Which SCP utility allows you to run diagnostic (FRU) tests against the boards in the system to identify units that need replacing?
- a. ATU
 - b. CON0
 - c. DTOS
 - d. ERRLOG
14. The CPU Instruction Cache is the same as the System Cache.
- a. True
 - b. False
15. The SCP Error Log information is never lost, even when the power is shut off.
- a. True
 - b. False
16. The SCP provides all the following functions EXCEPT:
- a. Microcode loader
 - b. Examine memory locations
 - c. Cancel print requests
 - d. Halt the CPU

S219/VS – AOS/VS System Manager

Module 3 Review

System Installation

1. It is a good idea to have DFMTR format an AOS/VS overlay area on several physical disks associated with your system.
 - a. True
 - b. False
2. Running a partial DFMTR will not destroy data on a disk since a read only surface analysis is done.
 - a. True
 - b. False
3. To “Graft” additional logical disk units to the file system, you must use the _____ CLI command.
 - a. GRAFT
 - b. PATCH
 - c. BUILD
 - d. INITIALIZE
4. If you are starting up from scratch (all disks are blank) you must first install AOS/VS before running DFMTR.
 - a. True
 - b. False
5. What is the minimum ACL for the master logical disk?
 - a. +,R
 - b. +,E
 - c. +,RE
 - d. +,WARE

6. Only a superuser can change the ACL of the master disk.
 - a. True
 - b. False

7. The microcode tape has a copy of the AOS/VS starter system on it.
 - a. True
 - b. False

8. The use of dual-ported disks is the same as mirroring.
 - a. True
 - b. False

9. The DFMTR is which file on the system release tape?
 - a. File 0
 - b. File 1
 - c. File 2
 - d. File 3

10. Data General hardware formats the disk before sending it to you, so it is necessary to software format the disk before you load software on it.
 - a. True
 - b. False

11. In order to boot your tailored AOS/VS system, you must first install it on the 'invisible area' of the disk.
 - a. True
 - b. False

12. During initial start-up, the microcode file from the microcode tape is written to disk with:
 - a. INSTL
 - b. DFMTR
 - c. SYSBOOT
 - d. CLI LOAD command

13. It is a good idea to make all your physical disks into a single logical disk.
- a. True
 - b. False
14. The remap area is used by AOS/VS for process swapping.
- a. True
 - b. False
15. It is a good idea to locate the bit map on the outside edge of the disk for better performance. In this way, the read/write head will only have to seek forward to find a file on the disk.
- a. True
 - b. False
16. If we specify a diagnostic area on the disk, then we can load the ADEX program there.
- a. True
 - b. False

S219/VS – AOS/VS System Manager

Module 4 Review

System Generation – VSGEN

1. Which VSGEN created file can be TYPED or QPRINTed?
 - a. sys.PR
 - b. sys.ST
 - c. sys.CSF
 - d. sys.SSF
2. The peripheral names used by VSGEN are controller names (DPJ, DPJ1...) not unit names (DPJ0, DPJ10...).
 - a. True
 - b. False
3. Under normal conditions (i.e., outside the S219/VS class), VSGEN can only be run by a SUPERUSER.
 - a. True
 - b. False
4. Which of the following is not a VSGEN switch?
 - a. /SAVE
 - b. /BATCH
 - c. /DEFAULT
 - d. /PARAMETERS
5. After you PATCH your system, the applied patch will not actually take effect until you shut the system down and bring it up again.
 - a. True
 - b. False

6. The ERMES file supplied with AOS/VS does not define error codes for products (FORTRAN, COBOL, C...). If you install products like these, you must add the ERMES files to the system ERMES file, otherwise your users will get "UNKNOWN MESSAGE CODE" responses.
 - a. True
 - b. False

7. The actual operating system created by VSGEN is which file?
 - a. sys.PR
 - b. sys.ST
 - c. sys.CSF
 - d. sys.SSF

8. On a typical AOS/VS system, which directory should you be in to execute VSGEN?
 - a. :UTIL
 - b. :VSGEN
 - c. :SYSGEN
 - d. : (root)

9. To install a new revision of AOS/VS, you must reformat your disks.
 - a. True
 - b. False

10. All systems must have a BBU, CON0, DPF, DPJ, and MTB defined just as they are in the starter system.
 - a. True
 - b. False

11. The VSGEN 'Cache size' question allows you to change the size of the system cache.
 - a. True
 - b. False

12. The default file element size on an AOS/VS system is:
- a. 1 disk block
 - b. 2 disk blocks
 - c. 4 disk blocks
 - d. 32 disk blocks
13. A disk block is _____ bytes.
- a. 4
 - b. 512
 - c. 1024 (1k)
 - d. 2048 (2k)
14. When doing VSGEN, the first IAC on the system is called IAC1, the second is called IAC2.
- a. True
 - b. False
15. Specifying NO for the Access question in VSGEN Parameters is almost the same as giving everyone SUPERUSER.
- a. True
 - b. False
16. When specifying the characteristics on console lines in VSGEN, if you want a value that is not part of the STANDARD, just put that after the prompt and it will be included with the standard items. (i.e., There is no need to tell VSGEN what the standards were. This will be added to it.)
- a. True
 - b. False

S219/VS - AOS/VS System Manager

Module 6 Review

File Backup

1. With the discrete backup, incremental dumps are only made of files that changed from the previous backup.
 - a. True
 - b. False
2. It is a good idea to store your backup tapes near the computer.
 - a. True
 - b. False
3. The best time to backup the entire system is when there is no one using it.
 - a. True
 - b. False
4. With disk mirroring, if you have a head crash on one disk, the mirrored disk will not be affected.
 - a. True
 - b. False
5. Using PCOPY or MSCOPY to tape, it is not possible to recover selected files from these backups.
 - a. True
 - b. False
6. The label utility will write an electronic label on the tape.
 - a. True
 - b. False
7. It is a good idea to periodically test your recovery methods just to see if your backups are being effective.
 - a. True
 - b. False
8. Write the CLI command to label a tape with a valid of BKUP01 that you have on MTB0.

S219/VS - AOS/VS System Manager

Module 7 Review

Processes

1. How is a program different than a process?
2. What function does the @NULL generic file serve?
3. Each process may use up to 4 Gigabytes of address space because of Virtual Memory.
 - a. True
 - b. False
4. Your working set may actually be larger than the amount of physical memory you have on your system.
 - a. True
 - b. False
5. A physical page fault occurs when your process needs something that is not in physical memory.
 - a. True
 - b. False
6. It is a good idea to set a small maximum working set size on your processes.
 - a. True
 - b. False
7. If you have a lot of processes competing on the system for the resources and the system is real slow, you are in a period of _____ contention.
 - a. Light
 - b. Medium
 - c. Heavy
 - d. No

8. A resident process is always in physical memory.
 - a. True
 - b. False
9. Swapping processes due to contention will actually help system performance for some processes.
 - a. True
 - b. False
10. An ineligible process is waiting for the CPU to schedule it.
 - a. True
 - b. False
11. AOS/VS always swaps a process to disk when the process is blocked.
 - a. True
 - b. False
12. Only processes that fall into group 2 are scheduled heuristically.
 - a. True
 - b. False
13. Group boundaries are set at Data General by the software developers and cannot be changed.
 - a. True
 - b. False
14. All users need the "Access devices" privilege so they can use their terminals.
 - a. True
 - b. False
15. The superuser privilege gives the user the ability to issue EXEC commands.
 - a. True
 - b. False
16. A "Big Pid" is any pid number greater than 255.
 - a. True
 - b. False
17. Each of the following make up the attributes of a process EXCEPT:
 - a. Default ACL
 - b. Searchlist
 - c. Demand Paging
 - d. Username

APPENDIX A

Sample Up Macros

Macro #1

```
[!EQUAL, ([!UNE,002, [!PID]]ERROR[!END]&  
%0\BACKUP\NOCONSOLES\NOINFOS\NOSQL\NONET\NOCEO\NOLOCK%%-%), (,)]
```

```
PRIORITY [!PID] 2
```

```
[!EQ,,%0/BACKUP%]
```

```
PROMPT HOST STRING DIRECTORY CHECKTERM  
SEARCHLIST :MACROS :UTIL :UTIL:CEO_DIR :  
SYSID ZELDA/VS - Boston Education Center -
```

```
PROCESS/DEFAULT/DIRECTORY=@/NAME=EXEC EXEC  
:NET:UTIL:WAIT_FOR_PORT @EXEC  
CONTROL @EXEC CONTINUE (1 2)  
STARTLPB  
STARTLQP
```

```
[!END]
```

```
[!EQ,,%0/NOINFOS%]
```

```
INFOS_UP
```

```
[!END]
```

```
[!EQ,,%0/NOSQL%]
```

```
UP.SQL/RESTART
```

```
[!END]
```

```
[!EQ,,%0/NONET%]
```

```
UP.NETWORK/UP
```

```
[!END]
```

```
[!EQ,,%0/NOCEO%]
```

```
CEO.SYSTEM START CHECKPOINT
```

```
[!END]
```

```
[!EQ,,%0/NOCONSOLES%]
```

```
CONTROL @EXEC ENABLE/ALL
```

```
[!END]
```

```
[!EQ,,%0/NOLOCK%]
```

```
DIR :
```

```
X LOCK_CLI PROMPT HOST DIR
```

```
[!END]
```

```
PRIORITY [!PID] 1
```

```
[!ELSE]
```

```
WRITE *ERROR*
```

```
WRITE %0\% IS VALID WHEN INVOKED BY THE ROOT CLI
```

```
WRITE OPTIONAL ARGUMENTS: NONE
```

```
WRITE OPTIONAL SWITCHES: /NOCONSOLES,,/NOINFOS,,/NONET
```

```
WRITE ...../NOLOCK,,/NOSQL,,/BACKUP,,/NOCEO
```

```
[!END]
```

Macro #2

```
COMMENT          UP.CLI FOR MV7800XP <FALCON>
COMMENT          LAST DATE MODIFIED 7-SEP-88

[!EQU [!PID] 2]
PUSH
PROMPT POP
SUPERUSER ON

COMMENT ***** GRAFTING ADDITIONAL LDU'S *****
INIT/S @DPF1
WRITE THE USER DISK HAS BEEN INITIALIZED :[!STRING]
INIT/S @DPF10
WRITE THE CEO_DIR DISK HAS BEEN INITIALIZED :[!STRING]
STRING/K

COMMENT ***** SET THE USER'S SEARCHLISTS *****
SEARCHLIST :UTIL : :UTIL:CEO_DIR :UTIL:MACROS

COMMENT ***** CLEAN UP :SWAP, :PAGE, AND :QUEUE *****
DIR :PAGE
DEL +
DIR :SWAP
DEL +
X :UTIL:QCMP/YES

COMMENT ***** DEFINE SYSID *****
SYSID MV7800XP Washington Ed Center
DIR :

COMMENT ***** SET ACL'S FOR DEVICES *****
ACL @CON16 +,WARE
ACL @CON17 +,WARE
ACL @MT- -,WARE

COMMENT ***** PROC UP EXEC.PR *****
PROCESS/DEFAULT/DIRECTORY=@/NAME=EXEC EXEC
PAUSE 2.000

COMMENT ***** START SYSLOG *****
COMMENT :UTIL:MACROS:SYSLOG_UP.CLI

COMMENT ***** BRING UP INFOS BEFORE ICOBOL AND CEO *****
:UTIL:MACROS:INFOS_UP.CLI
PAUSE 10

COMMENT ***** BRINGING UP THE NETWORK *****
:NET:UTIL:UP.NETWORK.CLI
PAUSE 4.00

COMMENT ***** BRING UP THE DATABASE PRODUCTS *****
:UTIL:MACROS:SQL_UP.CLI
PAUSE 3.00
:LANG:DBMS:DB
PAUSE 8.00
```

Macro #2 (Continued)

```
COMMENT ***** BRING UP CEO AND CEO RELATED PRODUCTS *****
:UTIL:MACROS:CEOUP.CLI
:SMART:SMART_UP.CLI
```

```
COMMENT *** START THE QUEUES, BATCH STREAMS, & SPOOLING DEVICES ***
CONTROL @EXEC CONTINUE 1
:UTIL:MACROS:START_LASER.CLI
:UTIL:MACROS:START_LPB.CLI
PAUSE 5
PROMPT DIR TIME CHECKTERMS
CONTROL @EXEC PRIORITY/PREE @CON17 127
```

```
COMMENT
COMMENT ***** ENABLING APPROPRIATE CONSOLES *****
COMMENT
:UTIL:MACROS:ENABLE_ALL.CLI
```

```
COMMENT ***** BRING UP SECRETARY AND LOCK_CLI *****
PAUSE 15.000
:UTIL:MACROS:UP.SECRETARY.CLI
:UTIL:MACROS:SECURE.CLI
```

```
[!EQUAL ,,COMMENT]
COMMENT ***** SET PROCESS PRIORITIES *****
:UTIL:MACROS:SET_PRIORITIES.CLI
```

```
COMMENT ***** OFFICE/Publisher Requirements *****
```

```
CE LIMIT PUBLISHER
CE PRIORITY PUBLISHER 1 3
CE CONTINUE PUBLISHER
[!END]
```

```
[!ELSE]
WRITE YOU MUST BE PID 2 TO EXECUTE THIS MACRO!
[!END]
```


APPENDIX B

Blank Documentation Form Examples

Process Group Layout Sheet

	RESIDENT	PREEMPTIBLE	SWAPPABLE
GROUP I	1		[Hatched Pattern]
	2		
	3		
	4		
	255		
GROUP II	256		
	257		
	258		
GROUP III	259		
	511		

CS-05887

Figure B.1

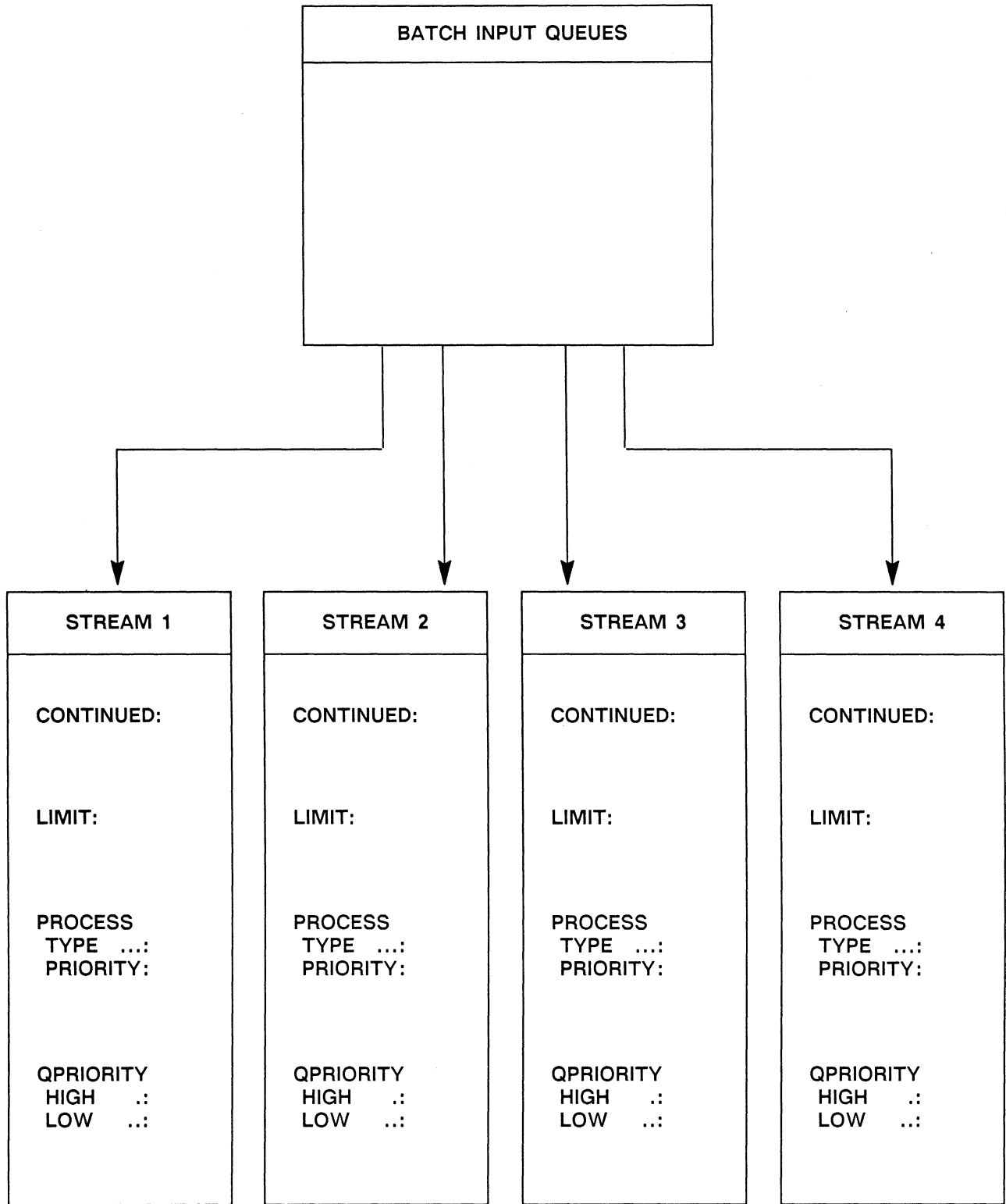
Process Group Layout Sheet

	RESIDENT	PREEMPTIBLE	SWAPPABLE
GROUP I	1		
	2		
	3		
	4		
	255		
GROUP II	256		
	257		
	258		
GROUP III	259		
	511		

CS-05887

Figure B.2

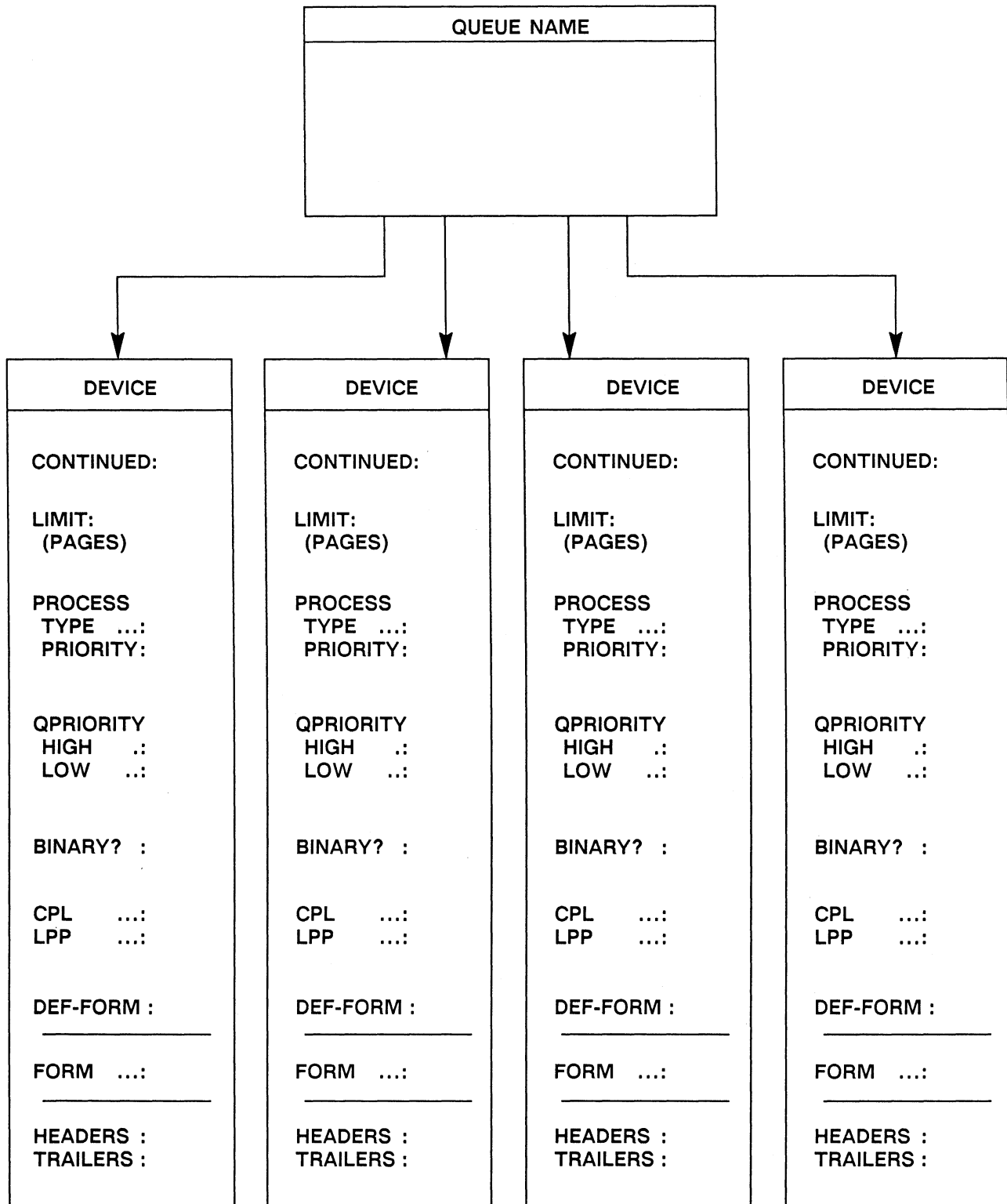
Batch Stream Planning Layout



CS-05894

Figure B.3

Queue/Device Diagrams



CS-05895

Figure B.4

Directory ACL Planning Sheet

DIRECTORY:

PARENT DIRECTORY:

LDU:

LOCATION DRAWING

USER CLASSES AND ACCESS

USERNAMES OR USER CLASS	ACCESS					FILES STORED IN THIS DIRECTORY
	E	R	A	W	O	

Directory ACL Planning Sheet

DIRECTORY:

PARENT DIRECTORY:

LDU:

LOCATION DRAWING

--

USER CLASSES AND ACCESS

USERNAMES OR USER CLASS	ACCESS					FILES STORED IN THIS DIRECTORY
	E	R	A	W	O	

IAC Map

IAC TYPE: 8 / 12 / 16 (Circle one)

DEVICE MNEMONIC _____ DEVICE CODE _____

Line #	Con #	Username	Device Type	User Type	Usage	Comments
--------	-------	----------	-------------	-----------	-------	----------

0						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

APPENDIX C

CLASP

Class-Based Scheduling Package

- System Manager
- Clasp
- Class Matrix
- User Locality
- Program Locality

- Job Processor
- Logical Processor
- Class ID
- Primary Class
- Secondary Classes
- Interval
- Overscheduling
- Class-Less Processes

Clasp Procedure

1. Define process environment without class-based scheduling.
2. Identify a limitation that can be corrected using CLASP.
3. Define the class-based scheduling environment.
 - a. CLASP:
 - b. SPRED:
 - c. PREDITOR:
4. Create a SCRIPT file.
5. Monitor the environment in accumulate mode.
6. If satisfactory, enable class-based scheduling.
7. Apply CLASP.
8. Create a SCRIPTFILE for use with UP.CLI.
9. Create an OVERVIEW file.

Class Allocation and Scheduling Package (CLASP)

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The system enforces class percentages over a constant interval. The interval is the number of seconds the connected JP spends serving user processes. When the interval expires, the system zeros its figures and starts counting again.

The system also zeros its interval when a JP becomes idle. This allows primary class processes whose class % allotment is exhausted to run if no other primary class process with time remaining wants CPU.

Generally you should allot the LP with no more, or less than 100% total. BUT, it is a good idea to allot processes like XODIAC, INFOS II, and CEO a 100% and give all other classes a total of 100%, so that server processes will never have to wait. Generally the server will not use its 100%, but if it needs the CPU, it should get it.

An exception to this rule of overscheduling is device-driver processes like PMGR. Any process that has issued a ?IDEF system call is considered to be a CLASS-LESS process and does not need to be considered for class-based scheduling. Class-less processes will always be considered as having percentage time available.

APPENDIX D

SMI Menu Examples

SMI Rev. nn.nn.nn.nn

dd-mmm-yy hh:mm

System Management Interface (SMI) Main Menu

- 1 Run a program or application
- 2 Control printers
- 3 Back up (dump) or restore (load) files
- 4 Run administrative functions
- 5 Run the interactive system management tutorial

Enter choice:

To exit from any menu, press the Cancel/Exit key (F11).
For assistance at any time, press the Help key (SHIFT-F1).

SMI Rev. nn.nn.nn.nn

dd-mmm-yy hh:mm

Administrative Functions Menu

- 1 Manage user profiles
- 2 Manage consoles
- 3 Customize the system
- 4 Manage printers and print queues
- 5 Control printer forms
- 6 Manage the batch queue
- 7 Send a command to the OP CLI process
- 8 Shut down the system

Enter choice:

To exit from any menu, press the Cancel/Exit key (F11).
For assistance at any time, press the Help key (SHIFT-F1).

SMI Rev. nn.nn.nn.nn

dd-mmm-yy hh:mm

Customize the System Menu

- 1 Specify system configuration
- 2 Install software
- 3 Change the system date or time
- 4 Specify a system to be the default system
- 5 Edit the UP macro
- 6 Edit the DOWN macro
- 7 Edit the system log-on message
- 8 Edit the system SETUP macro

Enter choice:

To exit from any menu, press the Cancel/Exit key (F11).
For assistance at any time, press the Help key (SHIFT-F1).

SMI Rev. nn.nn.nn.nn

dd-mmm-yy hh:mm

Control Printers Menu

- 1 Print files
- 2 Display contents of print queues
- 3 Cancel requests in print queues
- 4 Align printer paper
- 5 Pause a printer
- 6 Continue a printer
- 7 Clear a printer

Enter choice:

To exit from any menu, press the Cancel/Exit key (F11).
For assistance at any time, press the Help key (SHIFT-F1).

S219/VS
AOS/VS System Manager
